

L797 Concurrent Maintenance Library (CML)

Software Release Bulletin (SRB)

This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features and parameters.

Manual History

CML Level	SRB Release Date
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L797	June 26, 1991
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Important

Two copies of the CML L797 Software Release Bulletin (SRB) are included in the CML field kit; one copy is for the customer and the other is for the Control Data customer engineer (CE). Maintenance software reference manuals are also packaged within the CML field kit for use by the CE.

It is important that the CE be aware of all L797 features and cautions before installing CML. Control Data strongly recommends reading this SRB in its entirety before installing CML L797.

Revision letters I, O, Q, S, X, and Z are not used.

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About This Manual

In addition to other pertinent information, this Software Release Bulletin (SRB) describes CML L797 enhancements and instructs how to install CML L797.

Audience

The SRB is intended for the site analyst and hardware maintenance personnel.

Disclaimer

This product is intended for use only as described in this SRB. Control Data is not responsible for the improper operation of undescribed features, undefined parameters, or customer modifications.

CML L797 Support

Report CML L797 problems on a Programming System Report (PSR), specifying the nature of the problem and indicating the CML level as 797.

1-800-345-6628 (within the United States or Canada)

1-612-482-3434 (outside the United States or Canada)

Report problems with the media or contents of the CML L797 package contents to Software Manufacturing and Distributing (SMD). You can order replacement tapes from SMD by calling 1-612-482-3409 (if ordering a replacement tape by phone, please return the defective tape to SMD).

Reference Materials

Reference materials available for use with CML, but which are not provided with the CML kit, are listed below.

Reference Material	Publication Number/ Part Number
NOS/BE OLMS Reference Manual	60453900 M
NOS OLMS Reference Manual	60454200 M
MALET Reference Manual	60456020 AA
HPA User Reference Manual	60459460 K
CML L797 Diagnostic Microfiche	12198243 A
CML L774 Diagnostic Microfiche	12361055 Y
REL2B L739 Microfiche Listing	12361063 U
PL5A L650 Microfiche Listing	12361064 K

The Concurrent Maintenance Library (CML) L797 executes under NOS and NOS/BE operating systems and replaces all previously released versions of CML.

The CML L797 tape, which is labeled CMLVSN, is recorded in Scope Internal (SI) format. The file structure of the CML L797 tape is as follows.

- File 1 CML installation procedures described in the CML Reference Manual, publication number 60455980, revision Y.
- File 2 CML L797 program library in UPDATE format with a master control character of *.
- File 3 BUCAL binary of the buffer controller diagnostic MY8 (MY8BC) in a form compatible with the downline load requirements of MALET MY8.
- File 4 BUCAL binary of the buffer controller diagnostic BCX (BCXBC) in a form compatible with the downline load requirements of MALET BCX.
- File 5 TFL 2550 scratch file binaries.
- File 6 CR1 scratch file binary.
- File 7 Binaries of LCN tests NDM, NDP, and NDT in a form compatible with the downline load requirements of NLM.
- File 8 MCCOMP – Absolute binary of the microcode utility for NOS which compares two list files that were previously generated by program MCDUMP.
- File 9 MCDUMP – absolute binary of the microcode utility for NOS which read a control store dump from an EDD tape and converts it to hexadecimal digits.
- File 10 MTPLOT – absolute binary of the program which works with HPA to plot tape drive characteristics.

 DSPLOT – absolute binary of the program which works with HPA to plot disk drive characteristics.

 DKDATA – data file used for symptom codes for DSPLOT.
- File 11 Absolute binary of SKEDULAR which is used to submit maintenance programs to the NOS or NOS/BE input queue.
- File 12 Absolute binary of MLTDOC which is used to format MALET diagnostic documentation.

File 13¹ Assembled MALET diagnostic binaries for usage by NOS only: ATC, BCX, CCM, CIU, CLM, CRP, DFU, DH8, DL8, DMA, DM8, DTC, DTI, D44, D88, ELR, FEP, FFU, FHC, FHD, FLD, FLM, FMC, FMD, FMU, FSD, FSM, FTP, F44, F7X, F88, IDA, IDT, IST, ITU, LCI, LCM, LCN, LPE, LP1, MSD, MSM, MY8, NIP, NLM, PDP, RT3, RT5, TCT, TFE, TFF, TFL, TT3, T6X, and T7X.

1. Diagnostics CPE, CP1, CRE, CR1, and T5X have been deleted from the MALET tape to provide space for new L797 modules. See Notes and Cautions in chapter 2.

CML Installation

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This chapter describes CML L797 enhancements and the CML installation procedure.

Enhancements

CML L797 includes the following PSR code:

- CML0965 – Code modified in HPA to avoid data compression for on-the-fly and late-data tape errors.
Previously, HPA occasionally discarded on-the-fly and late-data tape errors if the error counts were identical.
- CMLB062 – Code added to HPA and NORM to support 5680 CYBER Cartridge Tape Subsystem (CCTS) and 5744 Automated Cartridge Subsystem (ACS) on NOS operating system.
- CMLB063 – Code modified in COMPIPA and COMPIPI to clear errors occurring after MALET diagnostics for DAS issue a disconnect.
Previously, an error could occur after MALET diagnostics issued a disconnect (only affected DAS controllers daisy chained on 25 Mbyte channels). Although the error was not valid, it was detected as a result of the next function sequence.
- CMLB065 – Code modified to print the summary of error locations for 9853 (optical) and 583X (DAS) disks. Additionally, error locations for 895 disks are sorted in ascending order.
Previously, the summary of error locations was not printed for 9853-type disks.
- CMLB066 – Code added to the T7X test series for 698/CYBER Channel Coupler (CCC) drives. The new module (T7X63) is a block ID test used to test the assembly/disassembly board in the CCC that is not parity protected. If all other T7X modules run without error and the block IDs do not compare, error code 236 and a message to replace PWA A02/B02 (FR205A) or PWA A02/A16 (FR205B) is displayed.
- CMLB067 – Code added to MALET to assure that a CIO channel is assigned to WLD, preventing the possibility of PP hangs.
- CMLB068 – Code added to MALET 3.2 to support 5680 CYBER Cartridge Tape Subsystem (CCTS) and 5744 Automated Cartridge Subsystem (ACS) on NOS operating system.
- CMLB069 – CMLB068 – Code added to TCT, CCM, and CLM tests to support 5680 CYBER Cartridge Tape Subsystem (CCTS) and 5744 Automated Cartridge Subsystem (ACS) on NOS operating system.
- CMLB071 – Code modified in CLM and CCM module 30 to post general status expected in addition to general status returned.
- CMLB072 – Code added to HPA and NORM to support 65860 Optical Disk (optical jukebox) on NOS operating system.
- CMLB070 – Code modified in CMLINST to support 5680 CYBER Cartridge Tape Subsystem (CCTS) and 5744 Automated Cartridge Subsystem (ACS) on NOS operating system.

Notes and Cautions

The following notes and cautions apply to CML L797:

- The CML L797 tape does not contain pre-assembled binaries of CPE, CP1, CRE, CR1, and T5X (they were removed to provide space for several new modules). Attempts to load these diagnostics via the BININST procedure results in abnormal termination of the procedure. If you need the diagnostics, you can assemble them from OLDPL, which is file 2 of the CML L797 tape.

NOTE

Although the diagnostics previously mentioned are not assembled on the tape that is delivered with CML, they are assembled on the tape that is delivered with the NOS operating system.

- HPA field length requirements can be reduced using the HPSORT parameter within the installation procedure. Usage of this parameter increases the execution time of HPA.
- The CMSI procedures are assembled for use with NOS 2.4.1 and higher. If CMSI is to be used on a system prior to NOS 2.4.1, use the CMLINST job to reassemble CML procedures from the release tape and include NOS23 as the SYSVER parameter. The CMSI procedures were developed by Engineering Services and problems found are identified using CMSI as the program name on PSRs. They are being provided as a convenience and their usage is not required to run CML products.

CML L797 Installation Procedure

Install CML L797 as instructed in the CML Reference Manual, publication number 60455980, revision AA. CML L797 has been tested with the following operating system levels.

NOS	2.6.1	L700/L688
NOS	2.6.1	L710
NOS	2.7.1	L716
NOS	2.7.1	L739
NOS	2.7.1	L750
NOS	2.7.2	L774
NOS	2.7.4	L797
NOS/BE	1.5	L664

The CML installation process replaces all existing copies of MALET diagnostics with new versions. These new versions may not execute properly if used with the older version of MALET and requires the installation of MALET, MLD, and SBP from this tape.

Configuration Management 3

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Peripheral Microcode Levels

Peripheral microcode versions furnished on the L797 CML tape are as follows (CML L797 was tested with these versions).

Name	Version	Description
MA401	08	844FT disk peripheral microcode
MA454	04	FSC disk peripheral microcode
MA462	06	ISD disk adapter peripheral microcode
MA464	10	895 disk peripheral microcode
MA466	03	5870 NIP peripheral microcode
MA710	13	844HT disk peripheral microcode
MA721	12	885/FMD disk peripheral microcode
MA722	03	885/FMD DEMA disk peripheral microcode
MB301	012	IPI tape peripheral microcode
MB401	04	FSC tape peripheral microcode
MB434	14	66X tape peripheral microcode
MB465/CW63X	04	639 ISMT tape control module peripheral microcode
MB466	03	7990 mass storage subsystem peripheral microcode
MB467	02	698 CMTS tape peripheral microcode
MD422	07	834 disk diagnostics
MD424	03	836 disk diagnostics
MG401	06	LCN peripheral microcode
MH422	07	834 disk COS
MH424	03	836 disk COS
MH426	09C	9853 disk COS
MH427	12	5830 DAS disk COS

Field Change Announcement (FCA) Index Levels

The Field Change Announcement (FCA) index level for CML L797 is as follows.

Mainframe System Type	Release Level
CYBER 170-815	10
CYBER 170-825	11
CYBER 170/180-835	11
CYBER 170/180-845	11
CYBER 170/180-855	14
CYBER 170-865	1
CYBER 170-875	1
CYBER 180-810/810A	7
CYBER 180-830/830A	7
CYBER 180-840/840A	8
CYBER 180-850/850A	8
CYBER 180-860/860A/870A	8
CYBER 960	3
CYBER 990/995	16
CYBER 994	3

NOTE

The CML Releases no longer are placed on the hardware FCA unless CML is interdependent with a hardware change.

Deck List

The deck list as read from CML L797 OLDPL is as follows.

YANK***	HISTORY	REASON	CDCMLI1	CDCMLI2	COMMTAL	COMMTDC	CMLINST
CAUTIONS	VERS	ASSYTAG	CDNDM	CDNDP	CDNDT	COMPCHN	COMPIPA
COMPPI	COMPCHI	COMPMA	COMPMSG	COMPOVR	COMSIPA	COMSIPI	CPYCOM
CPYFTN	HPACOM1	HPACOM2	HPACOM3	HPACOM4	COMHPAERT	COMHPASPE	HPADEFDSA
MALCOM	MALCD1	MALCD2	MALNK10	MALNK11	MALNK12	MALNK20	MALNK30
MALMAC	MALCMP	MALETP0	MALETP1	MALETP2	MALETP3	MALETP4	MALETP6
MALETP7	MALETP8	MALETP9	MALETPA	MALETPB	MALETPC	MALETPD	MALETPF
MALETPF	MALETPG	MALETPH	MALETPI	MALETPJ	MALETPK	MALETPL	MALETPM
MALETPP	MALETPR	MALETPS	TIOCOM	CWEOR1	MALET	MALET10	MALET11
MALET12	MALET20	MALET21	MALET22	MALET23	MALET24	MALET25	MALET26
MALET27	MALET28	MALET29	MALET2A	MALET2B	MALET2C	MALET2D	MALET2E
MALET2F	MALET2G	MALET2H	MALET2I	MALET2J	MALET2K	MALET2L	MALET2M
MALET2P	MALET2Q	MALET2R	MALET2S	MALET2T	MALET2U	MALETPT	MALET2U
MALETPU	MALET2Z	MALET30	MALET40	CWEOR2	MLTDOC	CWEOR3	ATC
BCX	CIU	CCM	CLM	CRP	CR1	CRE	CP1
CPE	DMA	DFU	DM8	DTC	DTI	D44	D88
FLM	FEP	FFU	ELR	FMCDS	FMCXX0	FHC	FMC
FMD	FMU	FSD	FSM	FSS	F88	FTP	F44
F7X	IDA	IDT	IST	ITU	LCI	LCN	LCM
LP1	LPE	MSD	MSM	MY8	NIP	NLM	PDP
RT3	RT5	SKEDULR	TCT	TFE	TFF	TFL	TT3
T5X	T6X	T7X	DSLOT	DKDATA	MCCOMP	MCDUMP	MTPLT
CWEOR4	HPACOM9	HPA	HPA1	HPA2	HPA21	HPA22	HPA23
HPA3	HPA31	HPA32	HPA33	HPA34	HPA35	HPA36	HPA37
HPA38	HPA39	HPA310	HPA311	HPA312	HPA313	HPA314	HPA315
HPA4	HPA5	HPA8	HPA9	CWEOR5	HPTEXT	CWEOR7	REGEN
TIO	CWEOR6	LOW	LCN1	LCN2	MUX	DEMA1	DEMA2
DEMA3	IFSD	ISD	ISD1	LSFMD1	LSFMD2	580	65X
66X	67X	841	844HT	844FT	MSSCSU	FMDHT	FMDFT
MSSMST	MSSMSC	DCART	DDAS	DESM	D895	P895D	MLD
WLD	SBP	CWEOR99					

Programming System Report List

A

The following PSRs have been corrected since CML L780 and are included in this release.

CML0965
CMLB057
CMLB058
CMLB060
CMLB061
CMLB062
CMLB063
CMLB064
CMLB065
CMLB066
CMLB067
CMLB068
CMLB069
CMLB070
CMLB071
CMLB072

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☐ Applications programmer
☐ Operator
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- ☐ As an overview
☐ To learn the product or system
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| ☐ | ☐ | ☐ Is the manual easy to read (print size, page layout, and so on)? |
| ☐ | ☐ | ☐ Do you use this manual frequently? |

Comments? If applicable, note page and paragraph. Use other side if needed. _____

Check here if you want a reply: ☐ _____

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Please send program listing and output if applicable to your comment.

DOCUMENT NUMBER
SMD800543

The material contained in this document is changes and additions,
which arrived too late to be put into a manual This information
will be incorporated into the CYBER Systems Peripherals
Diagnostic Referece Manual at CIP L757.

DO NOT ADD THIS DOCUMENT TO YOUR CURRENT PUBLICATION.

Introduction

This section contains a matrix for cross referencing the maintenance software tests available for each piece of peripheral equipment. The matrix is designed by the PP type, IOU type, bits per channel, and by the operating system to which the peripheral equipment is connected. From the matrix, the CE can determine the proper diagnostic test to be used.

The documentation for maintenance software tests that are MALET (DEMOT) based are located within the diagnostic test code. Refer to the CML Reference Manual, publication number 60455980, or CML/VE Reference Manual, publication number 60000019, for information on how to access the test documentation.

NOTE

The maintenance software diagnostics pertaining to CDCNET may be found in the CDCNET Troubleshooting Guide, publication number 60462630.

Maintenance Software Equipment to Diagnostic Reference Chart

	IOU Type		10	10	10	11/12	11/12	
	PP Type		---	---	---	---	---	
	Chan Type		ICI/C170	IPI	ICI/C170	ICI/C170	ICI/C170	
	Bits/Chan		16	16	12	12	16	
885 Disk (FMD)	MALET 3.2 under NOS					FHC DL8 FMC D88 FMD FMU FLD		
	MALET/VE under NOS/VE					FMC FHC DL8 FMU FLD		
	CMSE	DEMOT				FHC DL8 FMC D88 FMD FMU FLD		
		PP Compass						
9639 Tape QSE ISMT	MALET 3.2 under NOS							
	MALET/VE under NOS/VE		ITW ISW					
	CMSE	DEMOT						
		PP Compass	ISTU					
	9XX Console		ISTQ					
639 Tape (ISMT)	MALET 3.2 under NOS					ITU IST		
	MALET/VE under NOS/VE						ITW ISW	
	CMSE	DEMOT				ITU IST		
		PP Compass					ISTU	
	9XX Console							
895 Disk (33800)	MALET 3.2 under NOS					DMS DTI DFU		
	MALET/VE under NOS/VE					DMS DTI DFU		
	CMSE	DEMOT				DMS DTI DFU		
		PP Compass						
	9XX Console							

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Maintenance Software Equipment to Diagnostic Reference Chart

	IOU Type		10	10	10	11/12	11/12	
	PP Type		---	---	---	---	---	
	Chan Type		ICI/C170	IPI	ICI/C170	ICI/C170	ICI/C170	
	Bits/Chan		16	16	12	12	16	
5698 Tape (IPI CMTS)	MALET 3.2 under NOS							
	MALET/VE under NOS/VE			19X				
	CMSE	DEMOT						
		PP Compass		IPTU				
	9XX Console			IPTQ IPTX				
5680 Cartridge Tape	MALET 3.2 under NOS							
	MALET/VE under NOS/VE					TCT		
	CMSE	DEMOT				TCT		
		PP Compass						
	9XX Console							
5830 Disk Array Subsystem	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass		DAS10				
	9XX Console			LMD				
	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass						
	9XX Console							

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Maintenance Software Equipment to Diagnostic Reference Chart

		IOU Type	I4/I4A	I4/I4A	I4/I4A	I4/I4A	I4/I4A	I4/I4A
		PP Type	NIO	NIO	CIO	CIO	CIO	CIO
		Chan Type	ICI/C170	ICI/C170	ISI	ICI/C170	IPI-10	IPI-25
		Bits/Chan	12	16	16	12	16	16
885 Disk (FMD)	MALET 3.2 under NOS		FMC FHC D88 FMD FMU FLD DL8			FMC FHC D88 FMD FMU FLD DL8		
	MALET/VE under NOS/VE		FMC FHC FLD FMU DL8			FMC FHC FLD FMU DL8		
	CMSE	DEMOT	FMC FHC D88 FMD FMU FLD DL8			FMC FHC D88 FMD FMU FLD DL8		
		PP Compass						
887 Disk (Hydra)	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass			HYDR UHYD			
	9XX Console							
885 Disk (33800)	MALET 3.2 under NOS		DMS DTI DFU			DMS DTI DFU		
	MALET/VE under NOS/VE		DMS DTI DFU			DMS DTI DFU		
	CMSE	DEMOT	DMS DTI DFU			DMS DTI DFU		
		PP Compass						
	9XX Console							
9853 Disk (CM3/XMD3)	MALET 3.2 under NOS							
	MALET/VE under NOS/VE					IDT		
	CMSE	DEMOT						
		PP Compass				DPD14 LEEP		
	9XX Console							

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Maintenance Software Equipment to Diagnostic Reference Chart

		IOU Type	I4/14A	I4/14A	I4/14A	I4/14A	I4/14A	I4/14A
		PP Type	NIO	NIO	CIO	CIO	CIO	CIO
		Chan Type	IC/C170	IC/C170	ISI	IC/C170	IP1-10	IP1-25
		Bits/Chan	12	16	16	12	16	16
67X Tape (ATS)	MALET 3.2 under NOS		ATC T7X			ATC T7X		
	MALET/VE under NOS/VE		ATC T7X			ATC T7X		
	CMSE	DEMOT	ATC T7X			ATC T7X		
		PP Compass						
	9XX Console							
698 Tape (CMTS)	MALET 3.2 under NOS		T7X			T7X		
	MALET/VE under NOS/VE		T7X			T7X		
	CMSE	DEMOT	T7X			T7X		
		PP Compass						
	9XX Console							
CCC CYBER Channel Coupler	MALET 3.2 under NOS		CCM CLM			CCM CLM		
	MALET/VE under NOS/VE		CCM CLM			CCM CLM		
	CMSE	DEMOT	CCM CLM			CCM CLM		
		PP Compass						
	9XX Console							
9380 (STORNET) and ESM II w/STORNET Option	MALET 3.2 under NOS		MSD MSM			MSD MSM		
	MALET/VE under NOS/VE		MSD MSM			MSD MSM		
	CMSE	DEMOT	MSD MSM LSP			MSD MSM LSP		
		PP Compass	UESM			UESM		
	9XX Console							

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Maintenance Software Equipment to Diagnostic Reference Chart

		IOU Type	I4/I4A	I4/I4A	I4/I4A	I4/I4A	I4/I4A	I4/I4A
		PP Type	NIO	NIO	CIO	CIO	CIO	CIO
		Chan Type	ICI/C170	ICI/C170	ISI	ICI/C170	IPI-10	IPI-25
		Bits/Chan	12	16	16	12	16	16
5698 Tape (IPI CMTS)	MALET 3.2 under NOS							
	MALET/VE under NOS/VE						I9X	
	CMSE	DEMOT						
		PP Compass					ITL4	
	9XX Console							
5690 Cartridge Tape	MALET 3.2 under NOS							
	MALET/VE under NOS/VE		TCT			TCT		
	CMSE	DEMOT	TCT			TCT		
		PP Compass						
	9XX Console							
5830 Disk Array Subsystem	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass					DASH LEED	DASH LEED
	9XX Console							
	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass						
	9XX Console							

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Maintenance Software Equipment to Diagnostic Reference Chart

		IOU Type	I4C	I4C	I4C	I4C	I4C	
		PP Type	---	---	---	---	---	
		Chan Type	ISI	IPI-10	ICV/C170	ICV/C170	IPI-25	
		Bits/Chan	16	16	12	16	16	
5898 Tape (IPI CMTS)	MALET 3.2 under NOS							
	MALET/VE under NOS/VE			I9X				
	CMSE	DEMOT						
		PP Compass		ITL4				
	9XX Console			IT4				
5880 Cartridge Tape	MALET 3.2 under NOS							
	MALET/VE under NOS/VE				TCT			
	CMSE	DEMOT			TCT			
		PP Compass						
	9XX Console							
5830 Disk Array Subsystem	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass		DAS14 LEED			DAS14 LEED	
	9XX Console							
	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass						
	9XX Console							

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Maintenance Software Equipment to Diagnostic Reference Chart

		IOU Type	MS	MS	MS	MS	MS	MS
		PP Type	NIO	NIO	CIO	CIO	CIO	CIO
		Chan Type	ICV/C170	ICV/C170	ISI	ICV/C170	IPI-10	IPI-25
		Bits/Chan	12	16	16	12	16	16
885 Disk (FMD)	MALET 3.2 under NOS		FMC FHC D88 FMD FMU FLD DL8			FMC FHC D88 FMD FMU FLD DL8		
	MALET/VE under NOS/VE		FMC FHC FLD FMU DL8			FMC FHC FLD FMU DL8		
	CMSE	DEMOT	FMC FHC D88 FMD FMU FLD DL8			FMC FHC D88 FMD FMU FLD DL8		
		PP Compass						
887 Disk (Hydra)	MALET 3.2 under NOS							
	MALET/VE under NOS/VE							
	CMSE	DEMOT						
		PP Compass			HYDR2 UHYD2			
	9XX Console							
885 Disk (33800)	MALET 3.2 under NOS		DMS DTI DFU			DMS DTI DFU		
	MALET/VE under NOS/VE		DMS DTI DFU			DMS DTI DFU		
	CMSE	DEMOT	DMS DTI DFU			DMS DTI DFU		
		PP Compass						
	9XX Console							
9853 Disk (CM3/XMD3)	MALET 3.2 under NOS							
	MALET/VE under NOS/VE						IDT	
	CMSE	DEMOT						
		PP Compass					DPD4 LEEP	
	9XX Console							

M04402

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COMIPI/COMIPA Common Decks For Disks

2

Introduction

This section describes the operations and communications of COMIPI and COMIPA. COMIPI and COMIPA are common decks assembled into maintenance software programs which communicate with disk devices attached to an IPI channel. COMIPI is used with programs written for the 10mb IPI channel and COMIPA is used with programs written for the 25mb IPI channel.

These common decks establish communications with the peripheral disks and provide error and status information to the user.

COMIPI/COMIPA Overview

COMIPI/COMIPA consists of 18 different tasks for the calling program to use. When each task is complete, the following information is provided.

- Low-level error codes
- An IPI sequence status
- A word of general status
- One word of IPI Adapter Error status if I0 class IOU.
- Four words of IPI Adapter Error status if I4 class IOU.

COMIPI/COMIPA Task Descriptions

Table 2-1 describes the function of each COMIPI/COMIPA task.

Table 2-1. COMIPI/COMIPA Task Descriptions

Task	Title	Description
1	MASTER/SEL RESET	Performs a Master and Selective (Logical or Slave) Reset; via OEF bit SLR.
2	SELECT CONTROLLER	Selects the desired IPI disk controller.
3	DESELECT CONTROLLER	Deselects the desired IPI disk controller.
4	RESERVE DRIVE	Reserves the desired controller-to-drive path.
5	RELEASE DRIVE	Releases the desired controller-to-drive path.
6	SEEK	Moves the heads of the desired drive to the desired disk cylinder.
7	SEEK-READ DATA	Performs an implied seek, reads the given number of sectors from the desired drive, and stores them into the desired PP or central memory buffer.
8	SEEK-WRITE DATA	Same as task 7, except that it writes data to the disk drive from the desired PP or central memory buffer.
9	READ FROM CONTROLLER BUFFER	Reads a complete sector of bytes from the controller's data buffer and stores the bytes in the desired PP or central memory buffer.
10	WRITE TO CONTROLLER BUFFER	Same as task 9, except that it writes data to the controller's data buffer.
11	SELECT/ SEEK-READ/ DESELECT	Performs a Select Controller task, a Seek-Read task, and a Deselect Controller task.
12	SELECT/ SEEK-WRITE/ DESELECT	Performs a Select Controller task, a Seek-Write task, and a Deselect Controller task.
13	PERFORM CTRLR DIAG	Runs the selected controller's specified internal diagnostics.
14	PERFORM DRIVE DIAG	Runs the selected drive's internal diagnostics.
15	REQUEST DRIVE TYPE	Inputs the drive type status of the selected disk drive into the SB, under parameter IDs 50 and 54.

(Continued)

Table 2-1. COMIPI/COMIPA Task Descriptions (Continued)

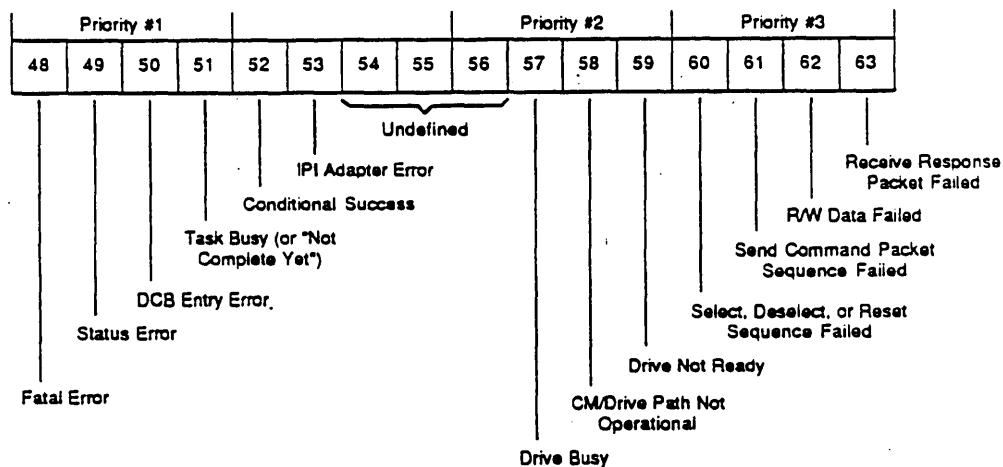
Task	Title	Description
16	REQUEST TASK COMPLETE	Polls the desired controller once to see if there are any outstanding interrupts. If an interrupt is present, the response packet is input; otherwise, the Task Busy bit in the General Status word is set.
17	INITIAL FORMAT	Causes the controller to format the entire HDA with 2048, 4096 or 8192 -byte sectors.
18	LOAD CTLR IML	Reads x sectors from central memory and streams it to the controller as IML data; or can burst-release x sectors of IML data at a time from PP or central memory.

NOTE

If any of these tasks fail with the Status Error bit set in General Status, the controller will usually be left in a selected state.

Status Word and Error Descriptions

The General Status word (word 16) bit descriptions, major controller/drive status bit definitions, and low-level error code descriptions are displayed and described in figure 2-1.



[11]

Figure 2-1. General Status Word Description

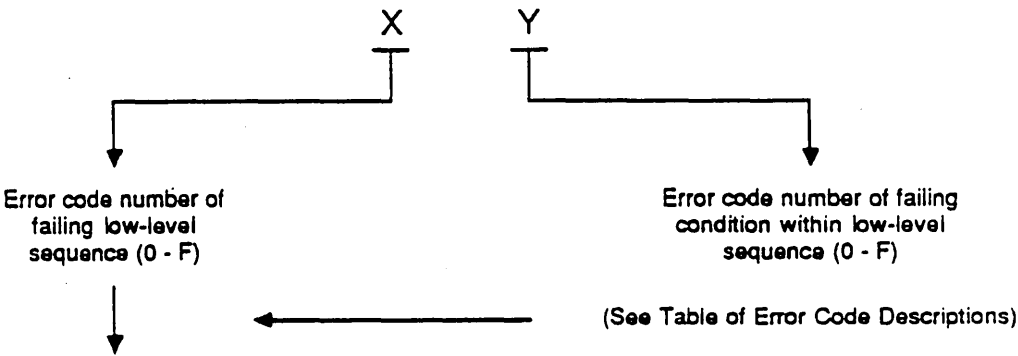
The table which follows describes each bit of the General Status word bits shown in figure 2-1.

Bit	Meaning
48	A hardware related error detected by either COMIPI/COMIPA or by the controller has occurred which prevented the SB from receiving any status, or a critical Class 3 response packet may have been received from the controller if the Status Error bit is also set. (Also see bits 60-63.)

- 49 The SB contains a response packet revealing a controller or drive related error. (Also see bits 57-63.)
- 50 The calling program has placed an illegal value in the DCB.
- 51 A previously issued task has not completed yet. (Used in conjunction with the Request Task Complete task to indicate that a response packet is not ready at the present time. This is also used with the Burst Release Enable option when throttling multi-sector data transfers. Task Busy means that another call to COMIPI/COMIPA needs to be made in order to continue the data transfer.)
- 52 The latest task involving a controller command has failed on its first attempt, but was successful upon retry by the subsystem. First failure data is contained within the response packet in the SB.
- 53 An error is present in the LSI Adapter's IPI Error Register.
- 54-56 Undefined.
- 57 The desired drive is busy, that is, reserved to another port.
- 58 The controller/drive is unable to send or receive commands.
- 59 The desired drive is not spun up and ready.
- 60 An error occurred during the Select, Deselect, or Reset sequence.
- 61 An error occurred during the Send Command Packet sequence.
- 62 An error occurred during the Read or Write Data sequence.
- 63 An error occurred during the Receive Response Packet sequence.

Low-Level Error Code Descriptions (Word 18)

Table 2-2 lists the low-level error codes of the COMIPI/COMIPA; all error codes are in hexadecimal.



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Figure 2-2. Low-Level Error Code Sequence

Low-Level Sequence Code Number	IPI Sequence Title or Error
0	IPI Adapter Function or DMA/I4 Error
1	Master/Selective Reset (MSR)
2	Select (SEL)
3	Bus Control (BSC)
4	Information Transfer Out (ITO)
5	Ending Status (EDS)
6	Response Handler (RSPHDL)
7	Information Transfer In (ITI)
8	Deselect (DSL)
9	Request Transfer Settings (RQTS)
E	Status-related error (Response Packet in SB)
F	DCB input error

Table 2-2. Low-Level Error Code Messages

Error Code	Description
0B	CHANNEL IS FULL AFTER T-REGS WERE LOADED
0C	DMA/I4 TRANSFER IN PROGRESS TIME-OUT ERROR
0D	DMA/I4 ERROR STATUS PRESENT
0E	CH ACTIVE BEFORE A FUNCTION OUTPUT
0F	CH ACTIVE 1 USEC AFTER A FUNCTION OUTPUT
11	ASYN RESP NOT FND DURING SELECTIVE RESET
21	SLAVE-IN RISE TIME-OUT ERROR
22	UNKNOWN CONTR LER ADDRESS RECEIVED
23	CH ER R AFTER LECT STATUS BYTE REC'D
31	SYNC-IN RISE TIME OUT ERROR
32	WRONG BUS ACKNOWLEDGE BYTE RECEIVED
33	CH ERROR FLAG IS UP AFTER INPUT OF BUS ACK BYTE
34	SYNC-IN FALL TIME-OUT ERROR
40	BASE FOR I4 ADAPTER DMA ERROR
41	WORD COUNT RESIDUE AFTER INFO TRANSFER OUT
42	CH EMPTY WHEN ADAPTER INPUT WORD EXPECTED
51	SLAVE-IN RISE TIME-OUT ERROR
52	CH ERROR FLAG AFTER ENDING SLAVE STATUS REC'D
53	INFORMATION TRANSFER NOT SUCCESSFUL
61	SLAVE INTERRUPT BYTE NOT PRESENT
62	CH ERROR AFTER SLAVE INTERRUPT RECEIVED
63	NO CONTROLLER INTERRUPT WITHIN ALLOTTED TIME
70	BASE FOR I4 ADAPTER DMA ERROR
71	WORD CNT RESIDUE EXISTS AFTER INFO XSFER IN
72	CH EMPTY WHEN ADAPTER INPUT WORD EXPECTED
81	SLAVE-IN FALL TIME-OUT ERROR

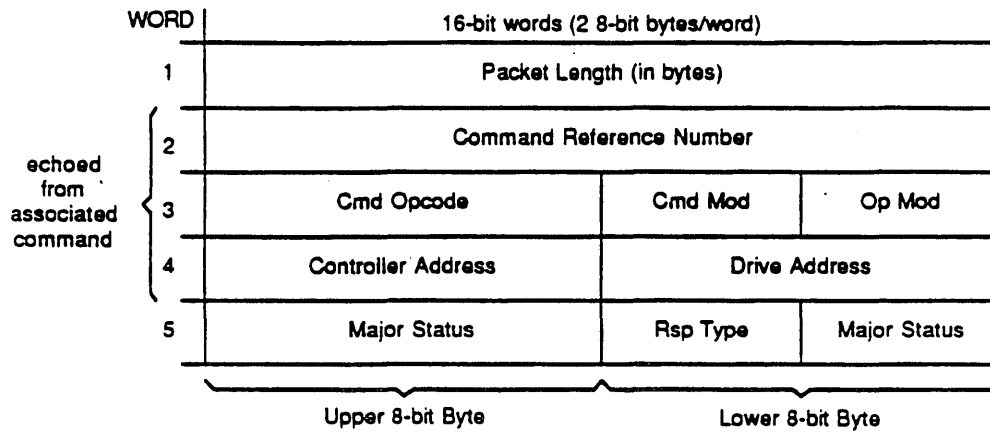
(Continued)

Table 2-2. Low-Level Error Code Messages (Continued)

Error Code	Description
91	SLAVE-IN RISE TIME-OUT ERROR
92	CH ERROR AFTER XSFER SETTINGS BYTE REC'D
93	SLAVE-IN FALL TIME-OUT ERROR
E0	OPERATION NOT SUCCESSFUL
E1	TASK IS BUSY -- NO RESPONSE PACKET YET
E2	DATA TRANSFER/SLAVE-IN TIME-OUT ERROR
E3	AN UNEXPECTED CLASS 2 INTERR WAS RECEIVED
E4	AN UNEXPECTED CLASS 1 INTERR WAS RECEIVED
E5	AN UNKNOWN RESPONSE TYPE WAS RECEIVED
E6	AN UNEXPECTED ASYNCHRONOUS RESPONSE WAS RECEIVED
E7	COMMAND HAD CONDITIONAL SUCCESS
E8	CRITICAL ERROR DURING ENDING STATUS SEQUENCE
E9	UNSUCCESSFUL DATA BURST TRANSFER
EA	DRIVE NOT OPERATIONAL AND READY
EB	CONTROLLER NOT OPERATIONAL AND READY
EC	UNRECOVERABLE DATA TRANSFER ERROR
F0	INVALID TASK SPECIFIED
F1	INVALID CONTROLLER ADDRESS SPECIFIED
F2	INVALID DRIVE ADDRESS SPECIFIED
F3	NO DATA TRANSFER LENGTH SPECIFIED (IN DCB+STC OR DCB+IBSC)

Status Buffer

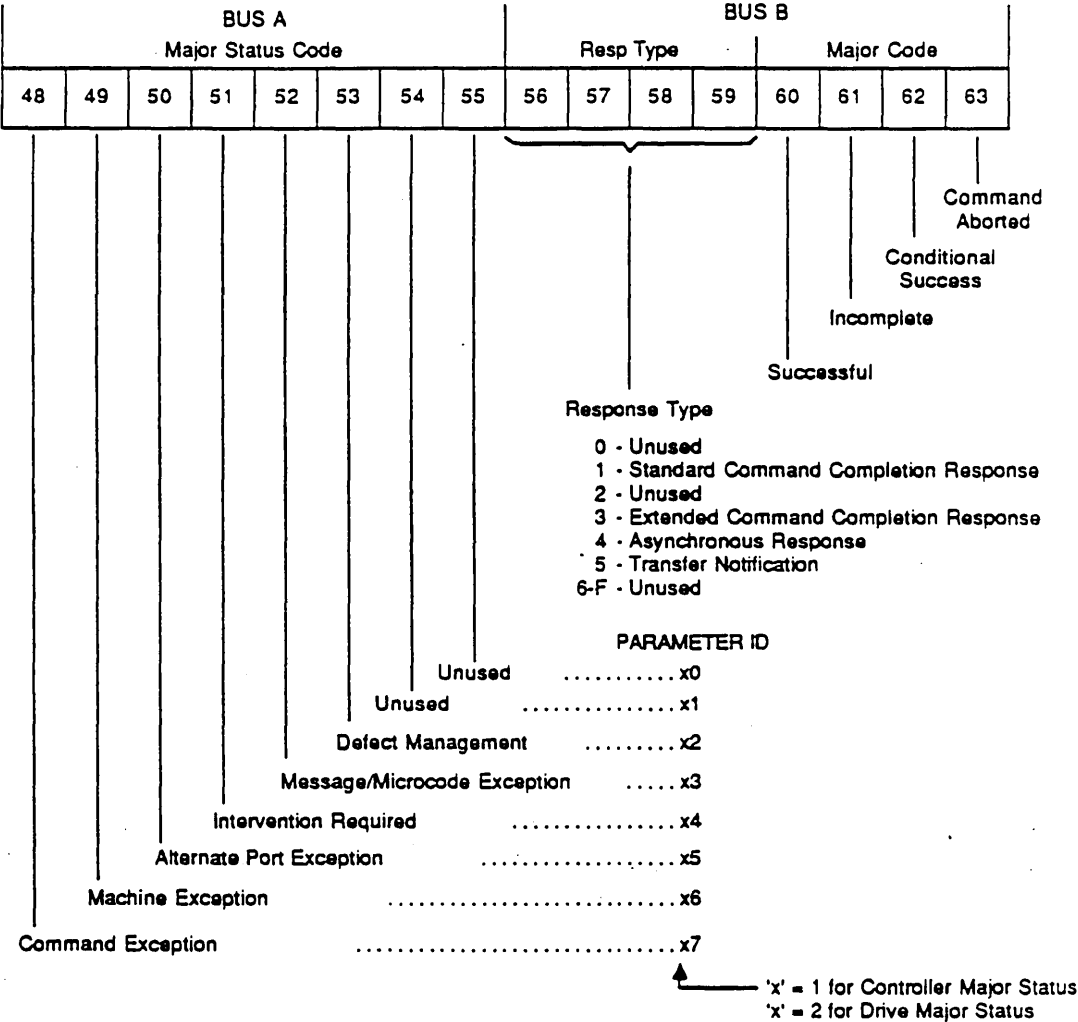
If COMIPI/COMIPA reports a status error in the general status word, the status buffer will contain a response packet sent by the controller. Response packet status is not only used by the controller to relay error information, but also host-specified information (like drive type status when Task 15 has been run successfully). This subsection describes the general form of a response packet. The first five words are defined in figure 2-3.



[3]

Figure 2-3. Response Packet Control Words

The status buffer's major status word (word 5) bits are defined in figure 2-4.



[4]

Figure 2-4. Major Status Word Bits

Introduction

HYDR, HYDR2 and HYDR4 are data integrity tests for the path between the CYBER I4 IOU and the 887 disk subsystem via the DMA enhanced ISI data channel. For convenience, this manual refers to HYDR for either use; substitute either HYDR, HYDR2 or HYDR4 depending on your computer system.

PRIMARY IOU	DIAGNOSTIC
I4A (NIO)	HYDR
I4S	HYDR2
I4C	HYDR4

NOTE

All references to PPs in this section, unless explicitly noted otherwise, refer to CIO type PPs.

HYDR is designed to be a detection only test and no attempts are made to isolate hardware failures. If prior to executing HYDR, you have executed the 887 inline diagnostics without error and the diagnostic ISI44 (ISI4 on an I4A, ISI42 on an I4S) has successfully executed, the deduction can be made that if HYDR fails, the failure is in the data path. The data path is defined as:

- The receiver/transmitters in the IOU.
- The connectors and wiring from the IOU to the 887 disk subsystem ISI interface board.
- The portion of the 887 disk subsystem ISI interface board that cannot be isolated by the 887 disk subsystem inline diagnostics.

Assumptions

The following assumptions apply to this test.

- The appropriate IOU tests have been run without error.
- The PPU based CM test CMT3 or CMT5 has been run without error.
- The CM buffer as defined in the parameter words is not being accessed by another system element.
- The 887 disk subsystem is powered on and the disk has been spun up.
- The 887 disk subsystem inline diagnostics have been run without error.
- The switches in the 887 subsystem have been set in the "same host ID" mode during dual channel testing (that is, running two copies of HYDR on the same physical 887 spindle over different 887 ports). HYDR will exhibit erroneous error messages when the 887 subsystem is in the "different host ID" mode.

WARNING

HYDR also assumes that the selection of the optional sections (that is, sections 09 through 15) means that the user intends to destroy the customer's data. The whole disk should be dumped before attempting to use sections 09 through 15.

Restrictions

When running multiple copies of HYDR or running other IOU/CPU based tests with HYDR, the following testing environments are prohibited.

- More than one system element (CPU or IOU based test) using the same area in the control module.
- CPU or IOU based tests forcing error conditions via the MAC.

The PPs and the DMA enhanced ISI channel adapters are grouped in clusters. A cluster is comprised of five PPs and five DMA enhanced ISI channel adapters. A PP in one cluster cannot access a DMA enhanced ISI channel adapter in the other cluster.

HYDR is organized by section, subsection, and condition events. Because subsequent events rely on the successful completion of previous events, the sequential order of section execution should be maintained.

Test Description

HYDR tests the DMA enhanced ISI channel adapter to 887 disk subsystem data path. The test is PP based and is divided into sections, subsections, and conditions. HYDR consists of sixteen sections as shown in table 7-1 and 7-2. The sections marked OPTIONAL are not part of the test that is run using the default parameters and are not intended for general use by field service personnel because those sections will destroy customer data.

Table 7-1. HYDR Sections

Section	Description
0	ISI Device Function Test
1	IHD Buffer Echo Test (Interlocked)
2	IHD Buffer Echo Test (NonInterlocked)
3	Write Maintenance Cylinder Test (Interlocked)
4	Write Maintenance Cylinder Test (NonInterlocked)
5	Read Maintenance Cylinder (Interlocked)
6	Read Maintenance Cylinder (NonInterlocked)
7	Write/Read/ Maintenance Cylinder Test (Interlocked)
8	Write/Read/ Maintenance Cylinder Test (NonInterlocked)

CAUTION

The following sections are *optional* and are not intended for field use because they will destroy customer data.

Table 7-2. Optional HYDR Sections

Section	Description
9	Write/Read/Compare All Cylinders Test (Specified).
10	Write/Read/Compare Per Parameter Test (Specified).
11	Read Cylinder(s) Parameterized Test (Specified).
12	Read Headers Test (Specified).
13	Write/Read/Compare All Cylinders Test (Open-Ended).
14	Write/Read/Compare Per Parameter Test (Open-Ended).
15	Read Cylinder(s) Parameterized Test (Open-Ended).

Loading Procedure

Load HYDR to a PP by using any one of the following procedures.

1. At the system console, enter:

LT,Cpp,HYDR (cr) or TL,Cpp,HYDR (cr) For I4A Class systems.

LT,Cpp,HYDR2 (cr) or TL,Cpp,HYDR2 (- For I4S Class systems.
cr)

LT,pp,HYDR4 (cr) or TL,pp,HYDR4 (cr) For I4C Class systems.

NOTE

HYDR will be loaded into PP number pp.

2. To load HYDR from the system console, execute the command buffer:

GO,HYDR (cr) For I4A Class systems.

GO,HYDR4 (cr) For I4C Class systems.

NOTE

HYDR will be loaded into PP(s).

An example and explanation of the command buffer is:

0000	HYDR	Command buffer title.
0001	CP,C,HYDR or CP,C,HYDR4	Load HYDR into first available PP.
0002	RU,/,100	Run HYDR to parameter stop.
0003	BP, /	Assign PP to B-display.
0004	TB	Terminate command buffer.
	n	

Other parameter changes may be made between 0001 and 0002. (See Parameters)

By default, the command buffer HYDR tests a channel with the same number as the PP number in which it (HYDR) resides and then halts at parameter stop.

Running Procedure

Running procedures for the HYDR are:

S (cr)	Stops test execution. This command is interpreted as a stop command; HYDR goes into an idle loop whereby communication is maintained with CMSE but no test activity takes place.
Spacebar	Starts or resumes test execution.
R (cr)	Restarts the test from the beginning.
Cxx or Sxx	Clear/set xx bit of PARAM0/1, where xx is the bit mnemonic such as SS, ST.
EP,num,adrs,data	Enter parameter data into PP number num at location address adrs.

Parameters

The parameter words are located at location 00123(8) in PP memory. Bit 2**0 is defined as the least significant bit of a word.

PARAM0 - Test Control (Location 00123(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
.	**	DE	DR	NU	NU	RC	RB	RS	RT	LE	SE	SC	SB	SS	ST

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ST	Stop at end of test.	SE	Stop on error.
SS	Stop at end of section.	LE	Log errors in dayfile.
SB	Stop at end of subsection.	RT	Repeat test.
SC	Stop at end of condition.	RS	Repeat section.
RB	Repeat subsection.	DR	Bypass all messages.
RC	Repeat condition.	DE	Display only error messages.
**	Reserved for CMSE 180 use.	*	Enable CMSE to alter PARAM0 bits via the Cxx/Sxx commands (EP command must be used to alter this parameter.)

NU Not Used. (NU)

Default selection is 100021(8)/8011(16). This corresponds to setting ST,SE and enabling CMSE to alter PARAM0 bits.

NOTE

I4A and I4S ONLY - Since the hardware design of the CIO PPs does not allow the NIO PPs to set and clear CIO channel flags, it is not possible to respond to the UP,Cpp command in order to drop out of Scope Mode. Therefore, although the SSM command places HYDR in Scope Mode, it is not possible to get out of Scope Mode, except by deadstarting the mainframe.

PARAM1 - Test Control (Location 00124(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
**	AB	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	***	.	NU	NU

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*	Bit 2	Bypass parameter stop.
***	Bit 3	Attention detection mode (0=Channel Flag, 1=Bus Idle Status).
Bit 14		Abort On Error.
**	Bit 15	Enable CMSE to alter PARAM1 bits
NU	Not Used(N-U)	

Default selection is 100010(8)/8008(16). This corresponds to enabling CMSE to alter PARAM1 bits. Use the EP command to set or clear these parameters.

Introduction

UHYD, UHYD2 and UHYD4 are offline monitors of the 887 disk subsystem inline diagnostics. They are also utility routines used to issue commands to the 887 disk subsystem and monitor the resulting activity. For convenience, this manual refers to UHYD for either use; substitute either HYDR or HYDR4, depending on your computer system.

PRIMARY IOU	DIAGNOSTIC
I4A (NIO)	UHYD
I4S (NIO)	UHYD2
I4C (CIO)	UHYD4

NOTE

All references to PPs in this section, unless otherwise noted, refer to CIO type PPs.

While some diagnostic features are available in UHYD, it is not a diagnostic or test and it should not be used as such.

Assumptions

The following assumptions apply to this test.

- The appropriate IOU tests for your IOU type have been run without error.
- A PP based central memory such as CMT3 or CMT5 has run without error.
- The 887 disk subsystem data path integrity test, HYDR, has run without error.
- The device whose address is given in PARAM9 is an 887 disk subsystem.
- The 887 disk subsystem is powered on and the disk has been spun up.

Restrictions

When running multiple copies of UHYD or running other IOU/CPU based tests with UHYD, the following testing environments are prohibited.

- CPU or IOU based tests forcing error conditions via the MAC.
- More than one program using the same DMA channel.

The PPs and the DMA enhanced ISI channel adapters are grouped in clusters. A cluster is comprised of five PPs and five DMA enhanced ISI channel adapters. A PP in one cluster cannot access a DMA enhanced ISI channel adapter in the other cluster.

The 887 disk subsystem inline diagnostics are organized in a hierarchical manner (that is, each test builds on a hardware base that was verified in a previous test). Because subsequent sections utilize the hardware tested in previous sections, the order of execution should be maintained. Otherwise, the detection/isolation capabilities of the inline diagnostics will be affected. Use of command code 70(16) maintains the correct order of execution. It may be executed by using the DIAG or T70 command.

Test Description

UHYD is designed to monitor the activity of up to sixteen 887 disk drives attached to the two ports of the I4's DMA enhanced ISI channel adapter. The activity is controlled by keyboard commands entered manually by the user/operator. Various displays and error messages are provided to assist the user/operator's monitoring task, but no effort is made to specifically test any hardware features, isolate hardware failures (it is assumed that all I4 diagnostics have been run error free), or analyze the results of tasks issued to the 887 disk subsystems.

The normal use of this utility is to initiate execution of 887 disk subsystem inline diagnostics and other subsystem commands. UHYD is basically a monitor program that accepts keyboard commands in order to begin execution of user selectable utilities. The monitor loop in the program controls the data that is displayed, updates the display clocks, checks bus idle status for bus slave busy, selects each bus slave in turn (if there is no bus slave at the address currently being issued, ABSENT is displayed), checks the bit significant response, checks for attention from the currently selected bus slave (if attention is present, bus slave status is read and displayed), and executes the task (utility) assigned to the bus slave by the user.

Loading Procedures

Load UHYD to a PP by using any one of the following procedures.

1. At the system console, enter:

LT,Cpp,UHYD (cr) or TL,Cpp,UHYD (cr) For I4A Class systems.

LT,Cpp,UHYD2 (cr) or TL,Cpp,UHYD (c- For I4S Class systems.
r)

LT,pp,UHYD4 (cr) or TL,pp,UHYD4 (cr) For I4C Class systems.

NOTE

UHYD will be loaded into PP number pp.

2. To load UHYD at the system console, execute the command buffer:

GO,UHYD (cr) For I4A Class systems.

GO,UHYD2 (cr) For I4S Class systems.

GO,UHYD4 (cr) For I4C Class systems.

NOTE

UHYD will be loaded into PP(s).

An example and explanation of that command buffer is:

0000	UHYD	Command buffer title.
0001	CP,C,UHYD or CP,C,UHYD4	Load UHYD in first available PP.
0002	RU,/ ,100	Run UHYD to parameter stop.
0003	BP,/	Assign current PP to B-display.
0004	TB	Terminate command buffer.
n		

Parameter changes may be made between 0001 and 0002 (see Parameters).

If parameter PARAM9 is not entered at or before parameter stop, UHYD uses a channel number equal to the PP number in which it resides.

Introduction

UESM, UESM42 and UESM4 are offline monitors for ESM/STORNET. They are also utility routines that can be used to issue commands to the low speed, fast transfer, and side door ports. For convenience, this manual refers to UESM for either use; substitute either UESM, UESM42 or UESM4, depending on your computer system.

PRIMARY IOU	DIAGNOSTIC
I4A (NIO)0	UES4
I4S(NIO)	UES42
I4C(CIO)	UES44

NOTE

All references to PPs in this section, unless explicitly noted otherwise, refer to CIO type PPs.

While some diagnostic features are available in UESM, it is not a diagnostic or test and it should not be used as such.

NOTE

This manual references models I and II as ESM I and II respectively, and models III and IV as STORNET models.

Assumptions

The following assumptions apply to this test:

- The appropriate IOU tests have been run without error.
- A PP based central memory such as CMT3 or CMT5 has run without error.
- The device whose address is given in I.PO is an ESM/STORNET subsystem.

Restrictions

- When running other IOU/CPU based tests with UESM the following testing environments are prohibited:
 - CPU or IOU based tests forcing error conditions via the MAC.
 - More than one program using the same channel.
- The PPs and the DMA enhanced CYBER channel adapters are grouped in clusters. A cluster is comprised of five PPs and five DMA enhanced CYBER channel adapters. A PP in one cluster cannot access a DMA enhanced CYBER channel adapter in the other cluster.
- UESM does not check for activity when performing a side door function command that may result in an error condition, such as writing relocation memory. The operator must take care that the command is not entered when it could affect memory operation.
- When performing utility sections on a low speed port and/or fast transfer DMA port, it uses system keyboard calls to move the test sequence to a test PP and to place it in execution. The operator must verify that he has selected a legal PP and that the PP is in the system idle loop.
- The test is defaulted to bypass access to the side door port. This must be changed with an MIU,xxxx command to display the error log and to function the side door port. When running the utility in a mainframe that does not have access to the side door port, the side door access must remain disabled. (See Utility Parameter Keyboard Commands for description of the MIU,xxxx command).
- When running another diagnostic concurrently which also accesses the side door port, an SRC command should be entered to release the channel after each access to allow other diagnostics to use the channel, also. When no other program is using the side door, a CRC command should be entered to speed up program execution.
- When running low speed or fast transfer DMA utilities with the stop all utilities option selected, the utilities use bit 0 of the eighteen-bit global flag register for communication of the stop condition.
- When performing reads with a low speed or fast transfer DMA port utility, the last two blocks to be read are read using the read one record (5041(8)) function. The read one record function is used to avoid SECDED errors or to avoid address overflow due to the look ahead logic attempting to read past the maximum address, as given in the utility command parameters.
- Clock margins of nominal, +2 percent, -2 percent, +4 percent, and -4 percent are provided using the SCM,x command.

CAUTION

The + and -4 percent may be set at the operator's risk.

Utility/Monitor Description

UESM is designed to provide a means of interfacing to the ESM/STORNET memory interface unit through the side door, fast transfer, and low speed ports.

UESM is basically a monitor program that will accept keyboard commands in order to begin execution of user selectable utilities. The utilities provide the user with the capability of initiating transfers on the various ports available with options as to type of transfer, beginning and ending addresses, and length of data block to be transferred.

UESM reads and interprets the error log data and displays its contents, monitors for error conditions and displays them, provides a means of reading and writing the relocation memory, and provides a means of reading the flag registers. In addition, it provides the means to perform basic side door functions and to perform automatic refresh margin scanning.

UESM provides commands to read, write and compare data in the ESM/STORNET memory through the low speed and fast transfer DMA ports in a utility format.

Loading Procedures

The utility consists of a PP program which is loaded into a CYBER 180 IOU PP. The program which is loaded into that PP is identified as UESM. In addition, if a utility routine is requested, the utility will make a system library call to load UE44CP (UESMCP for I4A, UE42CP for I4S) for a fast transfer DMA port, or UE44PP (UESMPP for I4A, UE42PP for I4S) for a low speed port.

The following commands are entered to call the program from the system load device:

CPxx,UESM,,P0,P1,P2,P3	Load UESM into PP xx and enter any octal patches using system commands.
BPxx,0	Assign B-display to PP xx.
AA	Assign A-display to display active display requests.
RUxx,100	Start execution of UESM in PP xx (See Parameters for parameter words P0-P3).

When using the disk as the system load device, these commands may be set up in the following command buffer on the disk and executed by entering the command, GO,UESM(cr).

0000	UESM	Command buffer title.
0001	CP,UESM	Load UESM in first available PP. Parameter changes may be made here (See Parameters).
0002	RU,/,100	Run UESM to parameter stop.
0003	BP, /	Assign current PP to B-display.
0004	AA	Assign A-display to display active display requests.
0005	TB	Terminate command buffer.
n		

Running Procedures

This section contains a list of the commands that the utility, UESM, accepts. All other commands not accepted by it or CMSE will cause UTILITY SECTION message to be displayed on the FORMAT ERROR - XXXX line (See Keyboard Command Error Messages).

Utility Control Keyboard Commands

The commands listed in this section are used to control the execution of the utility, UESM, and its displays.

Command	Description
(cr)	A carriage return entry (cr) without a job command will cause the job display presented by the utility to cycle through the normal job displays and the aid displays. Each carriage return will advance to the next display. The order of the displays is aid command display, aid parameter display, utility description display, double SECEDED error log display, and single error log display.
space bar	The space bar entry will resume execution of the utility routines.
L,x	This command selects job display x. If the display number parameter, x, is not in the range of 0 through 4, the keyboard command error message, RANGE ERROR -L,x, is displayed. The displays selected by the x parameter are as follows: - x=0, Parameter and test commands - x=1, Side door function commands - x=2, Utility commands - x=3, Double SECEDED error log - x=4, Single SECEDED error log
S	This command stops execution of the utilities and automatic margin scanning. If any utility is stopped, the message, UTILITIES STOPPED, appears in the job display. If automatic margin scanning is selected, the scanning is stopped at the current margin corrections and the message, MARGN HALT, will appear in the job display. If none are active when this command is processed, no action is taken.
D	This command terminates execution of the utility/monitor and returns control of the PP to the CMSE idler routine. Any margins are reset and any active utilities are terminated.
R	The test sequence is restarted from the beginning. All active utility operations are aborted and will have to be reentered.

Introduction

COMPSCD is a common deck assembled into maintenance software programs which communicates with the CC598A console and the Small Computer Standard Interface (SCSI) channel. This common deck establishes communications between the console and the IOU over the SCSI channel and provides error and status information to the user.

NOTE

SAT4 does not use this common deck.

COMPCSD Overview

COMPCSD is a SCSI I/O driver which is assembled into PP COMPASS maintenance software programs executing in the I4C PP. COMPCSD provides file and directory operations for the calling program. These operations or tasks, referred to as File Management Tasks (FMT), are for managing programs on the CC598A System Console disk. The interface used to transfer FMT information between the I4C and the CC598A disk is the differential SCSI bus.

Refer to table 12-1 for File Management Tasks performed by the driver.

Table 12-1. File Management Tasks

Task	Title	Description
0	Read SCSI Registers ¹	The Read SCSI Registers task reads all of the I4C's SCSI hardware registers and stores their contents in the calling program's PP data buffer.
1	Change Current Directory	The Change Current Directory task requests that the CC598A System Console change its current working directory to one of the following directories: CB, CDA, CTI, or MSL.
2	PP Program Load	The PP Program Load task informs the CC598A which file, under the current working directory, the calling program desires to have loaded into a specified PP (via the Two Port Mux) at a specified PP address and executed at a specified PP address.
3	Delete Current Directory Files	The Delete Current Directory Files task prompts the CC598A System Console to delete all files under the current directory.
4	List Directory	The List Directory task prompts the CC598A System Console to list its current working directory in either a sorted or unsorted format, beginning with the file name following the given offset number of files to skip and including the number of file names to be transferred as specified by the contents of DCB + DTL.

1. The SCSI Adapter hardware registers are defined in volume 1 of the IOU4 Associated Equipment L0-L3 Theory/Diagrams Hardware Maintenance Manual (60000235). Additional information on the SCSI Adapter can be found in the MSL 153/155, CYBER 96X Maintenance Software Test Procedures Reference Manual (60461110) and in the MSL 153/155, CYBER 96X Maintenance Software Test Descriptions Reference Manual (60461920).

(Continued)

Table 12-1. File Management Tasks (Continued)

Task	Title	Description
5	Write File	The Write File task allows the calling program to create a new file, with a given file name and given data, in the current CC598A working directory. If the file already exists and is write protected, an error results. If the file already exists, but is not write protected, the file will be written over.
6	Read File	The Read File task prompts COMPCSD to read an existing file (or part of an existing file) from the current CC598A working directory and then store the file in a designated PP data buffer.
7	Delete File	The Delete File task allows the calling program to delete an entire file from the current CC598A working directory.
8	Append to File	The Append to File task prompts the calling program to append data to an existing file in the current CC598A working directory (providing the file is not write protected).
9	Check Data Path to CIP	The Check Data Path to CIP task prompts COMPCSD to write and read/verify a short test file to/from the system console disk. This tests the PP to CC598A disk path.
10	Request File Length	The Request File Length task will cause the CC598A console to send, from under the current working directory, a 24-bit number which represents the length of the given file (in 16-bit words).

Error Handling

When a File Management Task encounters an error, COMPCSD will immediately pass a predefined error code to its error processing section. When all of the status and error locations have been loaded, an exit is then made to the calling program and a general status word is loaded into the PP's A-register.

COMPCSD Generated Error Codes

This subsection contains tables of all the COMPCSD generated error codes and their descriptions. The table which immediately follows classifies the COMPCSD generated errors according to error codes. The error codes are further defined in tables 12-2 through 12-10.

Error Code	COMPCSD Error
0x	General SCSI adapter or data transfer hardware related.
1x	Initialization.
2x	CC598A output data.
3x	Check for successful data output transfer status.
4x	Target disconnection wait loop after output.
5x	Target reselection wait loop.
6x	Target request message in wait loop.
7x	CC598A input data.
8x	Check for successful data input transfer status.
9x	Target disconnection wait loop after input.
Fx	DCB entry.

Table 12-2. 0x Code Errors

Error Code	Description
01	Channel active before Adapter function sent.
02	Channel was active 100ms after Adapter function sent.
03	Interrupt Pending time-out error.
04	Data verification error for FMT 9.
05	Last command ignored by SBIC chip.
06	Channel full time-out error waiting for input word after function.
07	Differential error on differential SCSI bus.
08	Channel inactive after a one word input.

Table 12-3. 1x Code Errors

Error Code	Description
10	Master clear function error.
11	Reset interrupt time-out error.
12	Read SCSI status register error.
13	Unexpected SCSI status after Local Master Clear.
14	Read Adapter status register error.
15	Write OWN ID register error.
16	Write Command Register with Reset command error.
17	Reset interrupt time-out error.
18	Read SCSI status register error.
19	Unexpected SCSI status after Reset command.
1A	Write Control register error.
1B	Write Time-Out register error.
1C	Write Sync Transfer register error.
1D	Write Transfer Count register 1 error.
1E	Write Source ID register error.
1F	Write Destination ID register error.

Table 12-4. 2x Code Errors

Error Code	Description
21	Write Command Descriptor Block register error.
22	Write Transfer Count registers error.
23	Write Command register with Select, Attention and Transfer command error.
24	Channel is full before data is ready to be output.
25	Adapter is not taking output data for target.
26	Residue after outputting the FSMOB.
27	Channel went inactive before data output transfer was complete.
28	Residue after outputting file data.
29	Channel inactive time-out after complete data output transfer.

Table 12-5. 3x/8x Code Errors

Error Code	Description
31,81	Select with Attention and Transfer command completion time-out error.
32,82	Read SCSI Status register error.
33,83	No command complete for Select with attention and Transfer command.
34,84	Read Command Phase register error.
35,85	Unexpected Command Phase status after Select with Attention and Transfer.
36,86	Read Auxiliary Status register error.
37,87	SBIC detected data parity error.
38,88	Unexpected Auxiliary status.
39,89	Read Target SCSI Status register error.
3A,8A	Target SCSI status error.
3B,8B	Read Adapter Status register error.
3C,8C	Adapter detected data parity error.
3D,8D	Unexpected Adapter status.

Table 12-6. 4x/9x Code Errors

Error Code	Description
41,91	Target disconnection time-out after outputting/inputting data.
42,92	Read SCSI Status register error.
43,93	No disconnect status after disconnect phase.

Table 12-7. 5x Code Errors

Error Code	Description
51	Target (CC598A) reselection time-out error.
52	Read SCSI Status register error.
53	No reselect status after reselect phase.

Table 12-8. 6x Code Errors

Error Code	Description
61	Request Message In interrupt time-out error.
62	Read SCSI Status register error.
63	Unknown Request Message In status after reselect phase.

Table 12-9. 7x Code Errors

Error Code	Description
71	Write Transfer Count registers error.
72	Write Command Phase register (with 44) error.
73	Adapter Read Enable function error.
74	Write Command register with Select with Attention and Transfer command error.
75	Channel never went full for data input transfer.
76	Residue after inputting the FSMIB data from the CC598A.
77	More incoming data present when not indicated by Console.
78	Channel full time-out when waiting for Console file data.
79	Channel inactive when more incoming data was expected.
7A	Residue after inputting expected file data.
7B	Channel inactive time-out after complete data input transfer.

Table 12-10. Fx Code Errors

Error Code	Description
F0	Invalid SCSI channel address specified.
F1	Invalid task (FMT) entry.
F2	Offset word count is too large (conversion to byte count resulted in an overflow of the upper 16-bit word).

CC598A Generated Error Codes

Table 12-11 contains a list of CC598A Console generated error codes (FSEC error codes) and their descriptions.

Table 12-11. CC598A Console Error Codes

Error Code	Description
0000	No errors - successful task.
0001	Unable to change directory.
0002	Unable to create file.
0003	File does not exist.
0004	Read Only - File is write protected.
0005	Invalid directory name.
0006	An open file exists - it now has been closed - current task has not been executed by the console.
0007	MS-DOS detected error.

General Status (GS) Word

GS is a 16-bit word of general status that is generated by the COMPCSD during or after an FMT operation. Bit position 0 of GS represents the most critical condition, while bit position 5 (the final GS bit used) represents the least critical condition. Refer to table 12-12 for a brief description of the utilized GS bits.

Table 12-12. GS Bits

GS Bit	Bit Nomenclature	Description
0	DCB Entry Error (DEE)	An invalid FMT was entered in the DCB, an invalid SCSI channel was specified, or an out-of-range offset count was entered. No task can proceed without a code change to the calling program.
1	Fatal SCSI Error (FSE)	A hardware-related error has occurred in the I4C/SCSI Adapter, the SCSI hardware, or on either end of the differential SCSI bus. The Local Master Clear bit must be set in the DCB by the calling program for the next FMT issued; the master clear is for recovery purposes.
2	File Server Status Error (FSSE)	Indicates that the File Server had an error when it attempted to access (or transfer) the requested file or directory. It also means that a File Server Error Code (FSEC) will be present in the TSB.
3		UNUSED
4	File Server Busy (FSB)	Indicates the File Server (or its DLD) is pre-occupied with another task.
5	End-of-File (EOF)	Informs the calling program that the latest read data transfer is the last to be performed for the current FMT, there is no more data to be read from the given file, and that the File Server has closed the given file.

INTRODUCTION

COMPIPT is a common deck assembled into maintenance software programs which communicates with tape devices attached to an IPI channel. COMPIPT establishes communications with the peripheral tapes and provides error and status information to the user.

OVERVIEW

COMPIPT is an IPI I/O driver which is assembled into maintenance software programs for tape devices attached on the 10mb IPI channel of a CYBER mainframe. COMPIPT consists of 23 different tasks. When each task is complete, the following information is provided.

- o Low Level Error codes
- o An IPI Sequence Status
- o A Word of General Status
- o A Word of IPI Adapter Error Status

TASK DESCRIPTIONS

Table x-x describes the function of each task.

Table x-x Task Descriptions

Task	Title	Description
1	Reset Controller	Performs a Master and Selective (Logical or Slave) reset.
2	Select Controller	Selects the specified tape controller.
3	Deselect Controller	Deselects the specified tape controller.
4	Reserve Tape Unit	Reserves the specified controller-to-drive path.
5	Release Tape Unit	Releases the specified controller-to-drive path.
6	Set/Report Tape Operating Mode	Report the selected tape unit's operating mode parameters or set (change) the tape unit's operating mode to the specified condition.

- | | | |
|----|--------------------------------|--|
| 7 | Space Block/File Mark | Causes the selected tape unit to make its' tape space (search) forward or backwards by the specified number of file marks or by a single data block (record). |
| 8 | Write File Mark | Write a single (File) tape mark or double (End of File) tape mark on the selected tape unit. |
| 9 | Tape Subsystem Status | Input the hardware condition status of the selected controller, or input the position and unit condition status of the selected tape unit. |
| 10 | Rewind Tape | Rewind the tape to Beginning of Tape (BOT). |
| 11 | Unload Tape | Rewind and unload the selected tape unit. |
| 12 | Erase Tape | Perform a Gap Erase or Security Erase on the selected tape unit. |
| 13 | Read Data from Tape | Read the specified amount of data from the selected tape unit as one record to either the PP or Central Memory. The read can be performed forward or reverse. |
| 14 | Write Data to Tape | Write the specified amount of data from the PP or Central Memory to the selected tape unit as one record. |
| 15 | Load Controller IML | Perform an Initial Microcode Load (IML) on the selected controller. |
| 16 | Change Controller Attribute | Change the selected controller's burst size attribute and/or its Conditional Success on Data Corrections attribute. |
| 17 | Request Information | Input the selected controller's model and revision information, or input the selected tape unit's model and revision information as data. |
| 18 | Request Task Complete | Determine if there are any outstanding interrupts (response packets) that the selected controller is issuing. If there are, read the response packet and check for Command Complete response code. If there are not, report TASK BUSY. |
| 19 | Perform Controller Diagnostics | Execute the selected controller's in-line diagnostics. |

- | | | |
|----|---------------------------|---|
| 20 | Perform Drive Diagnostics | Execute the selected tape unit's in-line diagnostics. |
| 21 | Read Controller Buffer | Read a single burst of data from the selected controller's data buffer into the PP or Central Memory. |
| 22 | Write Controller Buffer | Write a single burst of data from the PP or Central Memory to the selected controller's data buffer. |
| 23 | Read Tape to Controller | Read data from the selected tape unit into the selected controller's data buffer. |

STATUS WORD and ERROR DESCRIPTIONS

General Status

The following is the description of the General Status word.

General Status Word															
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
x	x	x	x	x	x	x	NU	x	x	NU	NU	x	x	x	x

NU = Not Used

Bit	Description	
48	Fatal Error	A hardware related error was detected which prevented status being returned, or a critical Class 3 response packet was received by the controller if the Status Error bit (Bit. 49) is also set.
49	Status Error	The status buffer contains a response packet revealing a controller or drive related error.
50	DCB Entry Error	The maintenance software program passed an illegal value to the common deck (DCB).
51	Task Busy	A previously issued task has not yet completed. This status is used in conjunction with the Request Task Complete task to indicate that a response packet is not ready at the present time. This is also used with the Burst Release Enable option when throttling multi-record data transfers.

- | | | |
|----|---------------------------|--|
| 52 | Conditional Success | The latest task involving a controller command failed on the first attempt, but was successful upon retry by the subsystem. First failure data is in the response packet in the Status Buffer. |
| 53 | IPI Adapter Error | A hardware error was reported by the IPI Adapter. The error is contained in the IPI Error Register. |
| 54 | Outstanding Tape Status | The current task was successful, but check the Tape Position Status for important tape status. |
| 56 | Tape Unit Busy | The task was unsuccessful because the tape unit was busy for more than half a second. |
| 57 | Tape Unit Not Operational | The tape unit is not currently operational. It is not ready, not cabled, etc.. |
| 60 | Select Error | An error occurred during the Select, Deselect or Reset sequence. |
| 61 | Send Command Error | An error occurred during the Send Command Packet sequence. |
| 62 | Read/Write Error | An error occurred during the Read or Write Data sequence. |
| 63 | RR Packet Error | An error occurred during the Receive Response Packet sequence. |

Tape Position Status

This status word contains tape position status after certain tasks are executed. The upper 8 bits contain valid tape data status only after executing the Read Data from Tape, Write Data to Tape, Read Tape to Controller Buffer or the Space Block/File Mark tasks. The lower 8 bits contain valid tape data status only after executing the Request Information task.

Tape Position Status Word															
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
x	x	x	x	x	x	x	x	x	x	x	NU	NU	NU	x	x

NU = Not Used

Bit	Description	
48	Beginning of Tape Detected	An attempt was made to move tape backwards past BOT.
49	End of Tape Detected	The tape heads have moved past EOT.
50	Tape Mark Detected	No data was transferred because a tape mark was encountered first.
51	Data Block Difference	The data record was over or under specified by the program.
52	Unrecorded Media	No data was detected over a large portion of the tape.
53	Data Length Difference	The controller has not transferred all of the data specified.
54	Odd Byte Transfer	An odd number of bytes was transferred.
55	Data Correction Performed	Data correction was performed by the hardware to get the current good data.
56	Beginning of Media	The tape heads are at BOT.
57	End of Media Warning	The tape heads are at EOT.
58	Media Present	The tape is ready for a tape motion command.
62	Default Recording Format	The tape density is set for 6250 BPI.
63	Write Protect	The tape's write ring is not installed on the tape.

Tape Subsystem Status

This word of status contains the controller and/or tape unit hardware condition status.

Tape Subsystem Status Word															
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
x	x	x	x	x	x	x	NU	x	x	x	x	x	NU	NU	NU

NU = Not Used

Bit	Description	
48	Operational	The controller can process bus exchanges.
49	Not Operational	The controller can not process bus exchanges.
50	Ready	The tape unit is ready to receive and execute commands from the controller.
51	Not Ready	The tape unit is not ready to receive and execute commands from the controller.
52	Reserved	The tape unit is reserved to another port.
53	Not Reserved	The tape unit is not reserved to another port.
54	L-Available	The controller is ready to receive commands from the Host.
56	Status Pending	The controller has status for the Host.
57	Active	The controller has accepted a command from the Host or has status for the Host.
58	Inactive	The controller has no commands or outstanding status.
59	P-Available	The controller or tape unit can respond to the physical interface.
60	Not P-Available	The controller or tape unit can not respond to the physical interface. It is disabled.

Error Codes

The following are the error codes and their descriptions generated by COMPIPT.

Error Codes

Code	Description
0x	IPI Adapter Function or DMA/I4 Errors
0B	The channel is full after the I4 T-registers are loaded
0C	DMA/I4 Transfer-in-Progress Error
0D	DMA/I4 Error Status present
0E	The channel was active before a function was sent
0F	The channel was active 1 microsecond after a function was issued.
1x	Master/Slave Reset Errors
11	Async response not found during the Task 1 reset
2x	Select Errors
21	Slave-in Rise Timeout error
22	Unknown Controller Address received
23	Channel Error after Select Status byte received from controller
3x	Bus Control Errors
31	Sync-in Rise Timeout error
32	Wrong Bus Acknowledge byte received
33	Channel Error Flag set after input of Bus Acknowledge byte
34	Sync-in Fall Timeout error
4x	Information Transfer Out Errors
40	Base for Adapter Function error
41	Word count residue after Information Transfer Out
42	Channel Empty when Input word expected

5x Ending Status Errors

- 51 Slave-in Rise Timeout error
- 52 Channel Error Flag set after Ending Status byte received
- 53 Information Transfer not successful

6x Response Handler Errors

- 61 Slave Interrupt byte not present
- 62 Channel Error after Slave Interrupt byte received
- 63 No Controller Interrupt within allotted time

7x Information Transfer In Errors

- 70 Base for Adapter Function error
- 71 Word count residue after data transfer input
- 72 Word count residue after inputting Response Packet
- 73 Channel Empty when input word expected

8x Deselect Errors

- 81 Slave-in Fall Timeout error

9x Request Transfer Setting Errors

- 91 Slave-in Rise Timeout error
- 92 Channel Error after Transfer Settings byte received
- 93 Slave-in Fall Timeout error

Ax Request Slave Interrupt Errors

- A1 Slave-in Rise Timeout error
- A2 Channel Error after Slave Interrupts byte received
- A3 Slave-in Fall Timeout error

Ex Status Related Errors

E0	Operation was not successful
E1	Task is busy -- No response packet yet
E2	Data transfer or Slave-in Timeout error
E3	An unexpected Class 2 interrupt was received
E4	An unexpected Class 1 interrupt was received
E5	An unknown response type was received
E6	An unexpected asynchronous response was received
E7	Command had Conditional Success
E8	Critical error during Ending Status sequence
E9	Unsuccessful data burst transfer
EA	Tape unit not operational and ready
EB	Controller not operational and ready
EC	Unrecoverable data error
ED	Unexpected interrupt -- Class 2 expected
EE	A parameter ID was not found in the response packet

Fx DCB Entry Errors (internal coding errors)

F0	Invalid task specified
F1	Invalid controller address specified
F2	Invalid tape unit address specified
F3	No data transfer length was specified
F4	Burst count not equal to 1 for Read/Write Controller Buffer task.

INTRODUCTION

DASI is an off-line data path integrity test for the 5830 Disk Array Subsystem (DAS). DASI0 executes on a CYBER 93X Computer System. DASI4 executes on all other CYBER Computer Systems. For convenience, this manual refers to DASI for either use; you should substitute DASI0 or DASI4 depending on your computer system.

DASI is designed to test the data path between the IOU, Central Memory and the Disk Subsystem. It also executes the controller and drive in-line diagnostics as well as formatting the drive.

ASSUMPTIONS

DASI assumes that the command operating system (COS) for the control module be loaded and running prior to execution.

RESTRICTIONS

DASI is not intended to test the integrity of the disk surface.

Repeat iteration and condition parameter bits are not supported.

Stop at end of iteration and condition param bits not supported.

DASI supports formatting of single drives only. It supports formatting of these drives in the 4K record size. It does not support parallel or parity configurations. The Operating System is the only vehicle to format a drive if used in a parallel or parity configuration.

TEST DESCRIPTION

DASI is PP based and executes under CMSE. It tests the non-DMA path between the IOU and the disk drive and the DMA path between central memory and the disk drive. DASI also invokes the in-line controller/drive diagnostics as well as providing a pack format utility.

DASI is divided into ten sections. Table x-x describes the sections.

TABLE X.X DASI Sections

Section	Description
0	Controller In-Line Diagnostics
1	Drive In-Line Diagnostics
2	Data Buffer Echo Test
3	Ones and Zeros Test
4	Alternating Ones and Zeros Test
5	Sliding Zeros Test
6	Sliding Ones Test
7	Random Data Pattern Test
8	User Specified Pattern and Disk Address Test
9	Format Pack Utility

Sections 0 thru 7 are default. Sections 8 and 9 are executed only if selected by the user through the parameter words.

The first section executes the controller in-line diagnostics. The second section executes the drive in-line diagnostics. The third section writes random data to the controller's buffer and reads it back.

In sections 4 through 8, one of sixteen different data patterns is written to a preallocated sector on the disk, read back, and compared with the data written. The data buffers are compared for each iteration. All data transfers to and from the actual disk are accomplished via central memory transfers. The data size may vary from 2k words to 8k words. Each pattern is written, read and compared ten times.

Section 8 will be executed only if selected by the user. It allows the use to specify both the disk address and the pattern to be written. Care should be taken when entering the disk address to avoid inadvertently destroying data on the disk.

Section 9 is a format utility for formatting the pack and is executed only if selected through parameter words.

LOADING PROCEDURES

DASI is loaded to a PP by using one of the following procedures:

1. At the system console, enter:

LT,x,DASIO <cr> or LT,x,DASI4 <cr>

where x is the PP number.

2. Execute the command buffer to load DASI. At the system console enter:

GO,DASIO (cr> or GO,DASI4 <cr>

Note: CMSE must be CM mode to execute these command buffers.

An example and explanation of the command buffer.

0000	DASIO	DASI4	
0010	CP,DASIO,,,	CP,C,DASI4	Load the Test
0011	EP,/,00125,00000	EP,/,00125,00000	Ch 00 CM 00 Unit 00
0012	EP,/,00126,0	EP,/,00126,0	0=Port A, 1=Port B
0013	.* EP,/,00127,377	.* EP,/,00127,377	Section Selects 0-7
0014	.* EP,/,00133,00000	.* EP,/,00133,00000	Disk Type 0=SABRE,1=SSD
0015	.* EP,/,00134,3134	.* EP,/,00134,3134	Disk Cyl for Section 8
0016	BP,/,,	BP,/,,	Assign PP to B Display
0017	RU,/,100	RU,/,100	Start Execution
0018	TB	TB	

RUNNING PROCEDURES

Basic Test Commands

S <cr> - Stops test execution. This command is interpreted as a stop command. DASI goes into an idle loop whereby communication is maintained with CMSE but no test activity takes place.

Spacebar - Starts or resumes test execution.

R <cr> - Restarts the test from the beginning.

Cxx or Sxx <cr> - Clear/set xx bit of PARAM0/1, where xx is the bit mnemonic such as SS, ST.

EP,num,adrs,data - Enter parameter data into PP num at location adrs. See Parameters for definitions and locations of test parameters.

PARAMETERS

The parameter words are located at located 00122(8) in PP memory. Bit 0 is defined as the least significant bit of a word. The following figures describe the bit locations and definitions for DASI.

PARAM0 - Test Control (Location 00122(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
*	**	DE	DR	NU	NU	RC	RB	RS	RT	LE	SE	SC	SB	SS	S
ST	Stop at end of test						SE	Stop on error							
SS	Stop at end of section						LE(1)	Log errors in dayfile							
SB	Stop at end of subsection						RT	Repeat test							
SC	Stop at end of condition						RS	Repeat section							
RB	Repeat subsection						DR	Bypass all messages							
RC	Repeat condition						DE	Display only error messages							
**	Reserved for CMSE 180 use						*	Enable CMSE to alter PARAM0 bit							
NU	Not Used							via the Cxx/Sxx commands							
															(EP command must be used to alt this parameter.)

Default selection is 100021(8)/8011(16). This corresponds to setting ST,SE and enabling CMSE to alter PARAM0 bits.

PARAM1 - Test Control (Location 00123(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
**	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	*	NU	N
Bit 2	Bypass parameter stop.														
Bit 3	Must be clear														
Bit 15	Enable CMSE to alter PARAM1 bits.														
NU	Not used														

Default selection is 100000(8)/8000(16). This corresponds to enabling CMSE to alter PARAM1 bits. Use the EP command to set or clear these parameters.

(1) LE is not supported on CYBER 930 Systems

PARAM2 - Repeat Test Count (Location 00124(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Bits 0...15 Repeat Test Count

Default is zero. The test will repeat the number of times (-1) contained in this location. The test will then unconditionally exit if the Repeat Test parameter bit is not set (PARAM0 Bit 6).

PARAM3 - Channel, Controller, Unit Select (Location 00125(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	CH	CH	CH	CH	CH	CH	CM	CM	CM	UN	UN	UN	UN	UN	UN

Bits 0...5 Unit Select

Bits 6...8 Control Module Select

Bits 9...14 Channel Number Select

Bits 15 Not Used (must be zero)

Default is 11000(8)/1200(16)

PARAM4 - IPI Port Selection (Location 00126(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	x

Bit 0 Port Select 0-Port A, 1-Port B

Bits 1...15 Not Used

Default is zero.

PARAM5 - Section Select (Location 00127(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	NU	NU	x	x	x	x	x	x	x	x	x	x

Bit 0 Section 0

Bit 1 Section 1

Bit 2 Section 2

Bit 3 Section 3

Bit 4 Section 4

Bit 5 Section 5

Bit 6 Section 6

Bit 7 Section 7

Bit 8 Section 8

Bit 9 Section 9

Bits 10...15 Not Used

Default is sections 0...7 selected. Sections 8 and 9 deselected.

PARAM9 - Disk Type Select (Location 00133(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU

Bit 0 Disk Type 0-Sabre V, 1-SSD
 Bits 1...15 Not Used

Default selection is zero.

PARAM10 - Disk Cylinder (Location 00134(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY

Bits 0...11 Disk Cylinder to use for reads and writes
 Bits 12...15 Not Used

Default selection is 3134(8)/65C(16). This is the default test cylinder for SABRE V. The default test cylinder for a SSD is 1513(8)/34B(16).

PARAM11 - Disk Track (Location 00135(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	TK	TK	TK	TK	TK	TK

Bits 0...5 Disk Track to use for reads and writes.
 Bits 6...15 Not Used

Default selection is zero. This parameter word is only used by section 8. The maximum track number for a Sabre V is 6(8) and 3(8) for a SSD.

PARAM12 - Disk Sector (Location 00136(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	SE	SE	SE	SE	SE	SE

Bits 0...5 Disk Sector to use for reads and writes.
 Bits 6...15 Not Used

Default selection is zero. This parameter word is only used by section 8. The maximum sector number for a Sabre V is 25(8) and 13(8) for a SSD.

PARAM13 - Test Pattern (Location 00137(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Bits 0...15 Data Test Pattern

Default selection is zero. This parameter word is only used by section 8.

PARAM14 - In-Line Diagnostic Subtest Select (Location 00140(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	NU	NU	XX	XX	XX	NU	NU	XX	XX	XX	XX	XX	XX	XX	XX

Bit 0	IPI3S3 Control Chip Test	Bit 9	Not Used
Bit 1	IPI3S3 IOP Test	Bit 10	IPI2 PCB Serial EEPROM Test
Bit 2	IPI3S2 Control Chip Test	Bit 11	IPI3 PCB Serial EEPROM Test
Bit 3	IPI3S2 IOP Test	Bit 12	Connector PCB Serial EEPROM Test
Bit 4	IPI3S1 Control Chip Test	Bit 13	Not Used
Bit 5	IPI3S1 IOP Test	Bit 14	Not Used
Bit 6	IPI3S0 Control Chip Test	Bit 15	MPU Diagnostic Port Test
Bit 7	IPI3S0 IOP Test		
Bit 8	Not Used		

Default selections is 116360(8)/9CF0(16).

PARAM15 - In-Line Diagnostic Subtest Select (Location 00141(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	NU	NU	XX	XX	XX	XX	XX	XX	NU	NU

Bit 0	Not Used	Bit 9	Not Used
Bit 1	Not Used	Bit 10	IPI2M0 Control Chip Test
Bit 2	IPI2M1 Control Chip Test	Bit 11	IPI2M0 Data Buffer 2 Test
Bit 3	IPI2M1 Data Buffer 2 Test	Bit 12	IPI2M0 Data Buffer 1 Test
Bit 4	IPI2M1 Data Buffer 1 Test	Bit 13	IPI2M0 DMA Pointers Test
Bit 5	IPI2M1 DMA Pointers Test	Bit 14	IPI2M0 DMA Errors Test
Bit 6	IPI2M1 DMA Errors Test	Bit 15	IPI2M0 IOP Test
Bit 7	IPI2M1 IOP Test		
Bit 8	Not Used		

Default selections is 176374(8)/FCFC(16).

PARAM16 - In-Line Diagnostic Subtest Select (Location 00142(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	NU	NU	XX	XX	XX	XX	XX	XX	NU	NU

Bit 0	Not Used	Bit 9	Not Used
Bit 1	Not Used	Bit 10	IPI2M2 Control Chip Test
Bit 2	IPI2M3 Control Chip Test	Bit 11	IPI2M2 Data Buffer 2 Test
Bit 3	IPI2M3 Data Buffer 2 Test	Bit 12	IPI2M2 Data Buffer 1 Test
Bit 4	IPI2M3 Data Buffer 1 Test	Bit 13	IPI2M2 DMA Pointers Test
Bit 5	IPI2M3 DMA Pointers Test	Bit 14	IPI2M2 DMA Errors Test
Bit 6	IPI2M3 DMA Errors Test	Bit 15	IPI2M2 IOP Test
Bit 7	IPI2M3 IOP Test		
Bit 8	Not Used		

Default selections is 176374(8)/FCFC(16).

PARAM17 - In-Line Diagnostic Subtest Select (Location 00143(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU

Bits 0...10 Not Used
 Bit 11 COS Checksum Test
 Bit 12 PDC Functional Test 2
 Bit 13 PDC Functional Test 1
 Bit 14 PDC Standalone Test 2
 Bit 15 PDC Standalone Test 1

Default selections is 174000(8)/F800(16)

PARAM18 - Repeat Subsection Count (Location 00144(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Bits 0...15 Repeat Subsection Count

The test will automatically repeat each subsection in the selected sections the number of times (-1) contained in this location. If PARAM18 = 0002, each subsection will be repeated once, resulting in two passes thru each subsection. Repeat Subsection PARAM0 bit 8 must be set.

Default selection is zero.

MESSAGES

Since all test messages are displayed on the B display, the B display must be assigned to the PP in which the test is executing before the test messages will be displayed. Note that dropping the test display by assigning the B display to a different PP, or central memory, will cause the present displayed test message to be lost. Assigning the B display back to the test PP will result in a blank display until the test displays a new message. The following is the general format for all messages.

```
DASI ZZ PCXXXX SSOSS SB00BB C00CC CHhh CMmm UNuu  
EC1=0000 EC2=YYEE TE=TTTT RN=NNNN  
AAA-----AAA
```

Where:

ZZ = Message type (one of the following)

- RU = Running
- SC = Stopped at end of condition
- SB = Stopped at end of subsection
- SS = Stopped at end of section
- ST = Stopped at end of test
- SE = Stopped on error
- RC = Repeating condition
- RB = Repeating subsection
- RS = Repeating section
- HT = Halted (operator stop)

XXXX = Pass count (decimal)

- SS = Current section number (decimal)
- PP = Current subsection number (decimal)
- CC = Current condition number (decimal)
- HH = IPI channel number (octal)
- MM = Control module (controller)
- UU = Disk unit

0000 = Error code 1 (hex) see appendix A

- EE = Error code 2
- YY = 00 for parameter, 10 for channel reserve, 20 for channel fault, 40 for disk 50 for data compare.

TTTT = Total error count (decimal)

NNNN = Random or base number used for generating data (hex)

AAA = Verbal error description (1 or more lines)

NORMAL MESSAGES

The following message is displayed at the beginning of the test to allow the user to set test parameters. This display is bypassed when the bypass parameter stop bit is set, PARAM1 bit 2.

DASI SET PARAMS PA=0122B YY/ MM /DD

DASI DATA PATH INTEGRITY TEST

Where:

PA = FWA of parameter area in PP memory

YY/MM/DD = Year/Month/Day (test's version assembly date)

The following message is displayed to warn the user that formatting the drive will result in loss of data on this drive.

DAS DATA PATH INTEGRITY TEST
FORMAT PACK UTILITY

----- WARNING -----
EXECUTION OF THIS FORMAT UTILITY WILL
RESULT IN LOSS OF ALL DATA ON THE
SELECTED DRIVE UNIT.
RUN TIME IS APPROX 4.5 MINS FOR SABRE
RUN TIME IS APPROX 1 MIN FOR SSD
----- WARNING -----

The following message is displayed to warn the user what cylinder, track and sector has been entered for writing when the Section 8 has been selected.

DAS DATA PATH INTEGRITY TEST
USER PATTERN AND SECTOR

----- WARNING -----
USER PATTERN AND SECTOR
DEFAULT TEST CYL SABRE = 3134
PARAMETERS SELECTED
CYLINDER 3134 TRACK 0000 SECTOR 0000
----- WARNING -----

ENTER (SPACE BAR) TO CONTINUE

The following message is displayed to tell the user that the task is still being executed. This will normally be displayed when formatting a drive.

DAS DATA PATH INTEGRITY TEST

ST-----ST

TASK BUSY

ERROR MESSAGES

This is the basic format for all disk subsystem error messages. Driver status and low level error code are software status information provided by the common decks, COMPIPI and COMPIPA. Refer to the section COMPIPI/COMPIPA for further information. Hardware major status and status buffer words are provided when available.

DASI SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=9000 EC2=4MOF TE=000T RN=NNNN

DAS DATA PATH INTEGRITY TEST

ST-----ST

DISK SUBSYSTEM ERROR

DRIVER STATUS GGGGH ADAPTER STATUS AAAAH

MAJOR STATUS RRRRH LOW LEVEL ERROR LLLH

STATUS BUFFER (HEX)

01D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
09D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
17D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
25D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD

Where:

M = Drive status priority 1-2 error.
F = Drive status priority 3 error (failing sequence).
GGGG = Driver status.
LLLL = Low level error code.
RRRR = Major status.
DDDD = Status buffer word in HEX.
AAAA = Adapter status word

EC2 Values and brief description of error.

400F Conditional success

This error indicates that the disk operation completed successfully, but only after retry. First failure data is contained in the status buffer.

- 410F Drive busy
This error occurs if the drive is reserved from the other access.
- 420F Drive not ready
This error indicates that the drive is present, but not ready and doesn't have a fault. This can occur if the drive is not spun up.
- 430F CM/Drive path not operational
This error indicates that the controller/drive is unable to send or receive commands.
- 440F Class 3 response packet was received
This error indicates that critical class 3 response packet was received from the controller. Error information is available in the status buffer.
- 450F Subsystem error
This error occurs as the result of some subsystem failure and no status is available from the controller.
- 460F Adapter error
This error code indicates a problem with the IPI adapter.

The data read in does not match the data written out at word (WWWW) in sector. Eight data words are displayed starting with the first miscompare.

DASI SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=9010 EC2=500C TE=000T RN=NNNN

DAS DATA PATH INTEGRITY TEST
ST-----ST

DATA COMPARE ERROR

SECTOR WORD WWWWH
IB IIII IIII IIII IIII IIII IIII IIII
OB 0000 0000 0000 0000 0000 0000 0000 0000

Where:

C = Transfer type that caused miscompare
IIII = Input data word.
0000 = Output data word.
WWWW = Sector word address where data compare failed.

EC2 values and their meaning.

- 5001 Compare error on non-DMA data transfer
This error occurred on a data transfer between the IOU and the DAS disk subsystem.

- 5005 Compare error after a DMA write
This error occurred on a data transfer from central memory to the
DAS disk subsystem.
- 5004 Compare error after a DMA read
This error occurred on a data transfer to central memory from the
DAS disk subsystem.

A disk parameter entered by the user has exceeded the range specified for
DAS disk subsystem or the channel specified is out of range.

DASI SE PCXXXX S000Y SB000Z C0000 CHCC CMMM UNuu
EC1=F200 EC2=000E TE=000T RN=NNNN

DAS DATA PATH INTEGRITY TEST
ST-----ST

DISK ADDRESS PARAMETER ERROR ALL VALUES IN OCTAL

CHANNEL CC
CYLINDER YYYY TRACK TTTT SECTOR SSSS
MIN-MAX SABRE CYL 0-3134 TRK 0-6 SEC 0-25
MIN-MAX SSD CYL 0-1513 TRK 0-3 SEC 0-13

Where:

CC = IPI Channel
YYYY = Cylinder.
TTTT = Track.
SSSS = Sector.

This error message will appear if the channel specified in PARAM3 is
reserved to some other PP.

DASI SE PCXXXX S000Y SB000Z C0000 CHCC CMMM UNuu
EC1=F200 EC2=1000 TE=000T RN=NNNN

DAS DATA PATH INTEGRITY TEST
ST-----ST

UNABLE TO RESERVE CHANNEL XX

This error message will appear if central memory space was not available for the DMA data buffers.

DASI SE PCXXXX S000Y SB000Z C0000 CHCC CMMM UNuu
EC1=F200 EC2=6000 TE=000T RN=NNNN

DAS DATA PATH INTEGRITY TEST
ST-----ST

CENTRAL MEMORY BUFFER NOT AVAILABLE

This error message will appear if the control module in-line diagnostics failed to complete execution in 70 seconds.

DASI SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=F200 EC2=7000 TE=000T RN=NNNN

DAS DATA PATH INTEGRITY TEST
ST-----ST

CONTROLLER (DRIVE) IN-LINES HUNG

SECTION DESCRIPTION

Section 00 Execute Controller In-line Diagnostics.

This section invokes the in-line diagnostics for testing the DAS. Tests are selectable through parameter words 14 through 17. All subtests are selected by default.

Section 01 Execute Drive In-line Diagnostics.

This section invokes the in-line diagnostics for testing the drive. There are no selectable subtests associated with this section.

Section 02 Control Module Buffer Echo Test.

This section tests the ability of the IPI data path to transfer data to and from the control module buffer.

Section 03 Ones and Zeroes Test.

This section tests the IPI data path from the PP to the disk by writing and reading one sector using a pattern of either all zeros and all ones.

Subsection 00 Zeroes Test

A pattern of all zeroes is written out to the default cylinder, track and sector and then read back and compared with the data written to see if there are any differences.

Subsection 01 Ones Test

A pattern of all ones is written out to the default cylinder, track and sector and then read back and compared with the data written to see if there are any differences.

Section 04 Alternating Ones Test.

This section tests the IPI data path from the PP to the disk by writing, reading and comparing one sector of alternating ones and zeros ten times for each pattern. The data is written to the default cylinder, track and sector.

Subsection 00 Pattern 5555(16)

Subsection 01 Pattern aaaa(16)

Section 05 Sliding Zeroes Test.

This section tests the IPI data path from the PP to the disk by writing, reading and comparing one sector of a sliding zeros pattern ten times for each pattern. The data is written to the default cylinder, track and sector.

Subsection 00 Pattern ef6e(16)
Subsection 01 Pattern df7d(16)
Subsection 02 Pattern 6ef6(16)
Subsection 03 Pattern 7df7(16)
Subsection 04 Pattern f6ef(16)
Subsection 05 Pattern f7df(16)

Section 06 Sliding Ones Test.

This section tests the IPI data path from the PP to the disk by writing, reading comparing one sector of a sliding ones pattern ten times for each pattern.

Subsection 00 Pattern 1041(16)
Subsection 01 Pattern 2082(16)
Subsection 02 Pattern 4104(16)
Subsection 03 Pattern 8208(16)
Subsection 04 Pattern 410(16)
Subsection 05 Pattern 820(16)

Section 07 Random Data Test.

This section tests the IPI data path from the PP to the disk by writing and reading one sector of random data ten times. Each iteration a different random seed based on the last word generated from the last set.

Section 08 User Specified Pattern and Disk Address.

This section tests the IPI data path from the PP to the disk by writing and reading one sector of the data pattern in PARAM13 ten times. The cylinder, track and sector used are in PARAM10- PARAM12. The user must check the parameters carefully before executing this section.

Section 09 Format Pack Utility.

This utility formats the entire data and CE partitions of the HDA including both the header fields and data fields. The command issued to the control module is the full volume format (initial) as described in the Product Spec. For the DAS, certification of the pack is not performed. A user warning message is displayed to prevent the user from inadvertently destroying data existing on the pack before proceeding with the format.

INTRODUCTION

DPDI is an off-line data path integrity test for the 9836/9853 disk subsystems. DPDI0 executes on a CYBER 93X Computer System. DPDI4 executes on all other CYBER Computer Systems. For convenience, this manual refers to DPDI for either use; you should substitute DPDI0 or DPDI4 depending on your computer system.

DPDI is designed to test the data path between the IOU, Central Memory and the Disk Subsystem. It also executes the controller and drive in-line diagnostics as well as formatting the drive.

ASSUMPTIONS

DPDI assumes that the command operating system (COS) for the control module is loaded and running prior to execution.

RESTRICTIONS

DPDI is not intended to test the integrity of the disk surface.

Repeat iteration and condition parameter bits are not supported.

Stop at end of iteration and condition param bits not supported.

TEST DESCRIPTION

DPDI is PP based and executes under CMSE. It tests the non-DMA path between the IOU and the disk drive and the DMA path between central memory and the disk drive. DPDI also invokes the in-line controller/drive diagnostics as well as providing a pack format utility.

DPDI is divided into ten sections. Table x-x describes the sections.

TABLE X.X DPDI Sections

Section	Description
0	Controller In-Line Diagnostics
1	Drive In-Line Diagnostics
2	Data Buffer Echo Test
3	Ones and Zeros Test
4	Alternating Ones and Zeros Test
5	Sliding Zeros Test
6	Sliding Ones Test
7	Random Data Pattern Test
8	User Specified Pattern and Disk Address Test
9	Format Pack Utility

Sections 0 thru 7 are default. Sections 8 and 9 are executed only if selected by the user through the parameter words.

The first section executes the controller in-line diagnostics. The second section executes the drive in-line diagnostics. The third section writes random data to the controller's buffer and reads it back.

In sections 4 through 8, one of sixteen different data patterns is written to a preallocated sector on the disk, read back, and compared with the data written. The data buffers are compared for each iteration. All data transfers to and from the actual disk are accomplished via central memory transfers. The data size may vary from 2k words to 8k words. Each pattern is written, read and compared ten times.

Section 8 will be executed only if selected by the user. It allows the user to specify both the disk address and the pattern to be written. Care should be taken when entering the disk address to avoid inadvertently destroying data on the disk.

Section 9 is a format utility for formatting the pack and is executed only if selected through parameter words.

LOADING PROCEDURES

DPDI is loaded to a PP by using one of the following procedures:

1. At the system console, enter:

LT,x,DPDIO <cr> or LT,x,DPDI4 <cr>

where x is the PP number.

2. Execute the command buffer to load DPDI. At the system console enter:

GO,DPDIO (cr> or GO,DPDI4 <cr>

Note: CMSE must be CM mode to execute these command buffers.

An example and explanation of the command buffer.

0000	DPDIO	DPDI4	
0010	CP,DPDIO,,,	CP,C,DPDI4	Load the Test
0011	EP,/,00125,00000	EP,/,00125,00000	Ch 00 CM 00 Unit 00
0012	EP,/,00126,0	EP,/,00126,0	0=Port A, 1=Port B
0013	.* EP,/,00127,377	.* EP,/,00127,377	Section Selects 0-7
0014	.* EP,/,00133,00001	.* EP,/,00133,00001	Disk Type 0=FSDII,1=XMD3
0015	.* EP,/,00134,2601	.* EP,/,00134,2601	Disk Cyl for Section 8
0016	BP,/,,	BP,/,,	Assign PP to B Display
0017	RU,/,100	RU,/,100	Start Execution
0018	TB	TB	

RUNNING PROCEDURES

Basic Test Commands

S <cr> - Stops test execution. This command is interpreted as a stop command. DPDI goes into an idle loop whereby communication is maintained with CMSE but no test activity takes place.

Spacebar - Starts or resumes test execution.

R <cr> - Restarts the test from the beginning.

Cxx or Sxx <cr> - Clear/set xx bit of PARAMO/1, where xx is the bit mnemonic such as SS, ST.

EP,num,adrs,data - Enter parameter data into PP num at location adrs. See Parameters for definitions and locations of test parameters.

PARAMETERS

The parameter words are located at located 00122(8) in PP memory. Bit 0 is defined as the least significant bit of a word. The following figures describe the bit locations and definitions for DPDI.

PARAM0 - Test Control (Location 00122(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
*	**	DE	DR	NU	NU	RC	RB	RS	RT	LE	SE	SC	SB	SS	S
ST	Stop at end of test						SE	Stop on error							
SS	Stop at end of section						LE(1)	Log errors in dayfile							
SB	Stop at end of subsection						RT	Repeat test							
SC	Stop at end of condition						RS	Repeat section							
RB	Repeat subsection						DR	Bypass all messages							
RC	Repeat condition						DE	Display only error messages							
**	Reserved for CMSE 180 use						*	Enable CMSE to alter PARAM0 bits via the Cxx/Sxx commands - (EP command must be used to alter this parameter.)							
NU	Not Used														

Default selection is 100021(8)/8011(16). This corresponds to setting ST,SE and enabling CMSE to alter PARAM0 bits.

PARAM1 - Test Control (Location 00123(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
**	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	*	NU	NU
Bit 2	Bypass parameter stop.														
Bit 3	Must be clear														
Bit 15	Enable CMSE to alter PARAM1 bits.														
NU	Not used														

Default selection is 100000(8)/8000(16). This corresponds to enabling CMSE to alter PARAM1 bits. Use the EP command to set or clear these parameters.

(1) LE is not supported on CYBER 930 Systems

PARAM2 - Repeat Test Count (Location 00124(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Bits 0...15 Repeat Test Count

Default is zero. The test will repeat the number of times (-1) contained in this location. The test will then unconditionally exit if the Repeat Test parameter bit is not set (PARAM0 Bit 6).

PARAM3 - Channel, Controller, Unit Select (Location 00125(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	CH	CH	CH	CH	CH	CH	CM	CM	CM	UN	UN	UN	UN	UN	UN

Bits 0...5 Unit Select

Bits 6...8 Control Module Select

Bits 9...14 Channel Number Select

Bits 15 Not Used (must be zero)

Default is 11000(8)/1200(16)

PARAM4 - IPI Port Selection (Location 00126(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	x

Bit 0 Port Select 0-Port A, 1-Port B

Bits 1...15 Not Used

Default is zero.

PARAM5 - Section Select (Location 00127(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
NU	NU	NU	NU	NU	NU	x	x	x	x	x	x	x	x	x	x

Bit 0 Section 0 Bit 6 Section 6

Bit 1 Section 1 Bit 7 Section 7

Bit 2 Section 2 Bit 8 Section 8

Bit 3 Section 3 Bit 9 Section 9

Bit 4 Section 4 Bits 10...15 Not Used

Bit 5 Section 5

Default is sections 0...7 selected. Sections 8 and 9 deselected.

PARAM6...PARAM8 Not Used (Locations 00130(8)...00132(8))

PARAM9 - Disk Type Select (Location 00133(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	

Bit 0 Disk Type 0-FSDII, 1-XMD3

Bits 1...15 Not Used

Default selection is one (XMD3).

PARAM10 - Disk Cylinder (Location 00134(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
NU	NU	NU	NU	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	C

Bits 0...11 Disk Cylinder to use for reads and writes

Bits 12...15 Not Used

Default selection is 2601(8). This is the default test cylinder for XMD3.
The default test cylinder for a FSDII is 1274(8).

PARAM11 - Disk Track (Location 00135(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	TK	TK	TK	TK	TK	T

Bits 0...5 Disk Track to use for reads and writes.

Bits 6...15 Not Used

Default selection is zero. This parameter word is only used by section 8.
The maximum track number for a FSDII is 27(8) and 22(8) for a XMD3.

PARAM12 - Disk Sector (Location 00136(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	SE	SE	SE	SE	SE	S

Bits 0...5 Disk Sector to use for reads and writes.

Bits 6...15 Not Used

Default selection is zero. This parameter word is only used by section 8.
The maximum sector number for a FSDII is 13(8) and 24(8) for a XMD3.

PARAM13 - Test Pattern (Location 00137(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Bits 0...15 Data Test Pattern

Default selection is zero. This parameter word is only used by section 8.

PARAM14 - In-Line Diagnostic Subtest Select (Location 00140(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Bit 0 Issuing Port Errors Test	Bit 9 PDI Sequencer Group 1 Test
Bit 1 Issuing Port Sequencer Group 3 Test	Bit 10 PDI Sequencer Group 0 Test
Bit 2 Issuing Port Sequencer Group 2 Test	Bit 11 Data Buffer Patterns Test
Bit 3 Issuing Port Sequencer Group 1 Test	Bit 12 Data Buffer Addressing Test
Bit 4 Issuing Port Sequencer Group 0 Test	Bit 13 MAGIC Registers Test
Bit 5 ECC/PDI Functional Test	Bit 14 MAGIC Errors Test
Bit 6 PDI Control Chip Test	Bit 15 MPU Diagnostic Port Test
Bit 7 PDI Sequencer Group 3 Test	
Bit 8 PDI Sequencer Group 2 Test	

Default selections is 177777(8)/FFFF(16)

PARAM15 - In-Line Diagnostic Subtest Select (Location 00141(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
XX	XX	XX	XX	XX	XX	NU	NU	XX	XX	XX	XX	XX	XX	NU	NU

Bit 0 Not Used	Bit 9 Alt. Port Errors Test
Bit 1 Not Used	Bit 10 Alt. Port Sequencer Group 3 Test
Bit 2 Not Used	Bit 11 Alt. Port Sequencer Group 2 Test
Bit 3 Not Used	Bit 12 Alt. Port Sequencer Group 1 Test
Bit 4 Not Used	Bit 13 Alt. Port Sequencer Group 0 Test
Bit 5 Not Used	Bit 14 Issuing Port Functional Test
Bit 6 COS Errors Test	Bit 15 Issuing Port Logic Test
Bit 7 Alt. Port Functional Test	
Bit 8 Alt. Port Logic Test	

Default selections is 177700(8)/FFC0(16)

PARAM16...PARAM17 Not Used (Locations 00142(8)...00143(8))

PARAM18 - Repeat Subsection Count (Location 00144(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	X

Bits 0...15 Repeat Subsection Count

The test will automatically repeat each subsection in the selected sections the number of times (-1) contained in this location. If PARAM18 = 0002, each subsection will be repeated once, resulting in two passes thru each subsection. Repeat Subsection PARAM0 bit 8 must be set.

Default selection is zero.

MESSAGES

Since all test messages are displayed on the B display, the B display must be assigned to the PP in which the test is executing before the test messages will be displayed. Note that dropping the test display by assigning the B display to a different PP, or central memory, will cause the present displayed test message to be lost. Assigning the B display back to the test PP will result in a blank display until the test displays a new message. The following is the general format for all messages.

```
DPDI ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm Unuu
EC1=0000 EC2=YYEE TE=TTTT RN=NNNN
AAA-----AAA
```

Where:

ZZ = Message type (one of the following)

- RU = Running
- SC = Stopped at end of condition
- SB = Stopped at end of subsection
- SS = Stopped at end of section
- ST = Stopped at end of test
- SE = Stopped on error
- RC = Repeating condition
- RB = Repeating subsection
- RS = Repeating section
- HT = Halted (operator stop)

XXXX = Pass count (decimal)

- SS = Current section number (decimal)
- PP = Current subsection number (decimal)
- CC = Current condition number (decimal)
- HH = IPI channel number (octal)
- MM = Control module (controller)
- UU = Disk unit

0000 = Error code 1 (hex) see appendix A

- EE = Error code 2
- YY = 00 for parameter, 10 for channel reserve, 20 for channel fault, 40 for disk 50 for data compare.

TTTT = Total error count (decimal)

NNNN = Random or base number used for generating data (hex)

AAA = Verbal error description (1 or more lines)

NORMAL MESSAGES

The following message is displayed at the beginning of the test to allow the user to set test parameters. This display is bypassed when the bypass parameter stop bit is set, PARAM1 bit 2.

DPDI SET PARAMS PA=0122B YY/ MM /DD

CM-3 DATA PATH INTEGRITY TEST

Where:

PA = FWA of parameter area in PP memory

YY/MM/DD = Year/Month/Day (test's version assembly date)

The following message is displayed to warn the user that formatting the drive will result in loss of data on this drive.

CM-3 DATA PATH INTEGRITY TEST
FORMAT PACK UTILITY

----- WARNING -----
EXECUTION OF THIS FORMAT UTILITY WILL
RESULT IN LOSS OF ALL DATA ON THE
SELECTED DRIVE UNIT.
RUN TIME IS APPROX 90 MINS FOR XMD3
RUN TIME IS APPROX 30 MINS FOR FSDII
----- WARNING -----

The following message is displayed to warn the user what cylinder, track and sector has been entered for writing when the Section 8 has been selected.

CM-3 DATA PATH INTEGRITY TEST
USER PATTERN AND SECTOR

----- WARNING -----
USER PATTERN AND SECTOR
DEFAULT TEST CYL XMD3 = 2601
PARAMETERS SELECTED
CYLINDER 2601 TRACK 0000 SECTOR 0000
----- WARNING -----

ENTER (SPACE BAR) TO CONTINUE

If the drive type is FSDII, the display will change to reflect the default cylinder for the FSDII (1274).

The following message is displayed to tell the user that the task is still being executed. This will normally be displayed when formatting a drive.

CM-3 DATA PATH INTEGRITY TEST

ST-----ST

TASK BUSY

ERROR MESSAGES

This is the basic format for all disk subsystem error messages. Driver status and low level error code are software status information provided by the common decks, COMPIPI and COMPIPA. Refer to the section COMPIPI/COMPIPA for further information. Hardware major status and status buffer words are provided when available.

DPDI SE PCXXXX S000Y SB000Z C0000 CHhh CMmm Unuu
EC1=9000 EC2=4MOF TE=000T RN=NNNN

CM-3 DATA PATH INTEGRITY TEST

ST-----ST

DISK SUBSYSTEM ERROR

DRIVER STATUS GGGGH ADAPTER STATUS AAAAH

MAJOR STATUS RRRRH LOW LEVEL ERROR LLLH

STATUS BUFFER (HEX)

01D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
09D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
17D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
25D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD

Where:

M = Drive status priority 1-2 error.
F = Drive status priority 3 error (failing sequence).
GGGG = Driver status.
LLLL = Low level error code.
RRRH = Major status.
DDDD = Status buffer word in HEX.
AAAA = Adapter status word

EC2 Values and brief description of error.

400F Conditional success

This error indicates that the disk operation completed successfully, but only after retry. First failure data is contained in the status buffer.

- 410F Drive busy
This error occurs if the drive is reserved from the other access.
- 420F Drive not ready
This error indicates that the drive is present, but not ready and doesn't have a fault. This can occur if the drive is not spun up.
- 430F CM/Drive path not operational
This error indicates that the controller/drive is unable to send or receive commands.
- 440F Class 3 response packet was received
This error indicates that critical class 3 response packet was received from the controller. Error information is available in the status buffer.
- 450F Subsystem error
This error occurs as the result of some subsystem failure and no status is available from the controller.
- 460F Adapter error
This error code indicates a problem with the IPI adapter.

The following message is displayed when the data read in does not match the data written out at word (WWW) in sector. Eight data words are displayed starting with the first miscompare.

```
DPDI SE PCXXX S000Y SB000Z C0000 CHhh CMmm Unuu
EC1=9010 EC2=500C TE=000T RN=NNNN
```

```
CM-3 DATA PATH INTEGRITY TEST
ST-----ST
```

DATA COMPARE ERROR

SECTOR WORD WWWH

```
IB IIII IIII IIII IIII IIII IIII IIII
OB 0000 0000 0000 0000 0000 0000 0000 0000
```

Where:

C = Transfer type that caused miscompare
IIII = Input data word.
0000 = Output data word.
WWW = Sector word address where data compare failed.

EC2 values and their meaning.

- 5001 Compare error on non-DMA data transfer
This error occurred on a data transfer between the IOU and the CM-3 disk subsystem.

- 5005 Compare error after a DMA write
 This error occurred on a data transfer from central memory to the
 CM-3 disk subsystem.
- 5004 Compare error after a DMA read
 This error occurred on a data transfer to central memory from the
 CM-3 disk subsystem.

A disk parameter entered by the user has exceeded the range specified for
CM-3 disk subsystem or the channel specified is out of range.

DPDI SE PCXXXX S000Y SB000Z C0000 CHCC CMMM UNUU
EC1=F200 EC2=000E TE=000T RN=NNNN

CM-3 DATA PATH INTEGRITY TEST
ST-----ST

DISK ADDRESS PARAMETER ERROR ALL VALUES IN OCTAL

CHANNEL CC
CYLINDER YYYY TRACK TTTT SECTOR SSSS
MIN-MAX XMD3 CYL 0-2601 TRK 0-22 SEC 0-24
MIN-MAX FSDII CYL 0-1274 TRK 0-27 SEC 0-13

Where:

CC = IPI Channel
YYYY = Cylinder.
TTTT = Track.
SSSS = Sector.

This error message will appear if the channel specified in PARAM3 is
reserved to some other PP.

DPDI SE PCXXXX S000Y SB000Z C0000 CHCC CMMM UNUU
EC1=F200 EC2=1000 TE=000T RN=NNNN

CM-3 DATA PATH INTEGRITY TEST
ST-----ST

UNABLE TO RESERVE CHANNEL XX

This error message will appear if central memory space was not available for the DMA data buffers.

DPDI SE PCXXXX S000Y SB000Z C0000 CHCC CMMM UNUU
EC1=F200 EC2=6000 TE=000T RN=NNNN

CM-3 DATA PATH INTEGRITY TEST
ST-----ST

CENTRAL MEMORY BUFFER NOT AVAILABLE

This error message will appear if the control module in-line diagnostics failed to complete execution in 70 seconds.

DPDI SE PCXXXX S000Y SB000Z C0000 CHhh CMmm Unuu
EC1=F200 EC2=7000 TE=000T RN=NNNN

CM-3 DATA PATH INTEGRITY TEST
ST-----ST

CONTROLLER (DRIVE) IN-LINES HUNG

SECTION DESCRIPTION

Section 00 Execute Controller In-line Diagnostics.

This section invokes the in-line diagnostics for testing the CM-3. Tests are selectable through parameter words 14 and 15. All subtests are selected by default.

Section 01 Execute Drive In-line Diagnostics.

This section invokes the in-line diagnostics for testing the drive. There are no selectable subtests associated with this section.

Section 02 Control Module Buffer Echo Test.

This section tests the ability of the IPI data path to transfer data to and from the control module buffer.

Section 03 Ones and Zeroes Test.

This section tests the IPI data path from the PP to the disk by writing and reading one sector using a pattern of either all zeros and all ones.

Subsection 00 Zeroes Test

A pattern of all zeroes is written out to the default cylinder, track and sector and then read back and compared with the data written to see if there are any differences.

Subsection 01 Ones Test

A pattern of all ones is written out to the default cylinder, track and sector and then read back and compared with the data written to see if there are any differences.

Section 04 Alternating Ones Test.

This section tests the IPI data path from the PP to the disk by writing, reading and comparing one sector of alternating ones and zeros ten times for each pattern. The data is written to the default cylinder, track and sector.

Subsection 00 Pattern 5555(16)

Subsection 01 Pattern aaaa(16)

Section 05 Sliding Zeroes Test.

This section tests the IPI data path from the PP to the disk by writing, reading and comparing one sector of a sliding zeros pattern ten times for each pattern. The data is written to the default cylinder, track and sector.

Subsection 00 Pattern ef6e(16)
Subsection 01 Pattern df7d(16)
Subsection 02 Pattern 6ef6(16)
Subsection 03 Pattern 7df7(16)
Subsection 04 Pattern f6ef(16)
Subsection 05 Pattern f7df(16)

Section 06 Sliding Ones Test.

This section tests the IPI data path from the PP to the disk by writing, reading comparing one sector of a sliding ones pattern ten times for each pattern.

Subsection 00 Pattern 1041(16)
Subsection 01 Pattern 2082(16)
Subsection 02 Pattern 4104(16)
Subsection 03 Pattern 8208(16)
Subsection 04 Pattern 410(16)
Subsection 05 Pattern 820(16)

Section 07 Random Data Test.

This section tests the IPI data path from the PP to the disk by writing and reading one sector of random data ten times. Each iteration a different random seed based on the last word generated from the last set.

Section 08 User Specified Pattern and Disk Address.

This section tests the IPI data path from the PP to the disk by writing and reading one sector of the data pattern in PARAM13 ten times. The cylinder, track and sector used are in PARAM10-PARAM12. The user must check the parameters carefully before executing this section.

Section 09 Format Pack Utility.

This utility formats the entire data and CE partitions of the HDA including both the header fields and data fields. The command issued to the control module is the full volume format (initial) as described in the Product Spec. For the CM-3, certification of the pack is not performed. A user warning message is displayed to prevent the user from inadvertently destroying data existing on the pack before proceeding with the format.

IPTX [IPTX.BIN]

Introduction

IPTX is a console-based EEPROM microcode loader for the 5698 Tape Subsystem when attached to a Cyber 93X system.

IPTX is designed to load the EEPROM microcode and verify the correct status following the operation.

Assumptions

IPTX assumes that the OS is not running.

Restrictions

IPTX does not test any of the tape subsystem.

No other programs are allowed to be executing while IPTX is performing EEPROM loading.

Loading Procedure

IPTX resides on the hard disk on the system console. All loading is performed via the console driven menus. The steps are as follows:

1. From the console main menu, select "Maintenance."
2. From the maintenance menu, select "Engineering Tasks."
3. From the engineering tasks menu, select "IPI 5698 Tape Microcode Loader."
4. A message will appear at the bottom of the screen indicating that the console is "Uploading IPTX.BIN". This process takes a few minutes.
5. Once the IPTX menu appears you will be required to enter "1" for Auto-scan mode or "2" for manual mode.
6. After manually inputting the channel(s) or having auto-scan determine the channel(s), you have the option of selecting whether or not to update that controller's microcode.
7. Press the F3 key to start the loading of microcode.

Running Procedure

The load procedure is started immediately after the F3 key is pressed.

Messages

The following is the general format for all messages.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      IPC MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

Normal Messages

The following is the LIMD menu for selecting automatic or manual channel input.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      IPC MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

ENTER 1 - AUTO SCAN OR 2 - MANUAL INPUT FOR IPC

The following display is if automatic channel selection was selected.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      IPC MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

SCANNING CH xx EQ xx FOR IPC ... PLEASE WAIT ...

The following is displayed if the manual channel selection was selected.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      IPC MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

ENTER CH AND EQ NUMBER FOR 1ST CLUSTER (EG. 051) OR <CR> TO CONTINUE.

After the channel selection is complete (manual or automatic), the following display is presented.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
IPC MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	IPI CHAN	TAPE EQUIP	ADDRESS	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0		COSxx	NO	

PLEASE SELECT IPC'S AND HIT F3 TO START DOWNLOAD.

The following message is displayed after pressing the F3 key.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
IPC MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	IPI CHAN	TAPE EQUIP	ADDRESS	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0		COSxx	YES	

COPYING MB301 LEVEL XX TO CM ...PLEASE WAIT...
UPLOADING DATA TO PPU ...PLEASE WAIT...

The following message is displayed while loading the microcode.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
IPC MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	IPI CHAN	TAPE EQUIP	ADDRESS	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0		COSxx	YES	UPDATING

VERIFYING LOAD ...PLEASE WAIT...

Error Messages

If an error is encountered during the loading of the microcode, the following is displayed.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
IPC MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	IPI CHAN	TAPE EQUIP	ADDRESS	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0		XXXX	YES	FAILED

FAILURE - IPC ON CH xx EQ xx STATUS xxxxx TASK xx
HIT <CR> TO IGNORE OR <ESC> TO EXIT

Refer to the section on COMPIPT for a detailed description of STATUS and TASK. NOTE: The status and task numbers are displayed in octal.

INTRODUCTION

LEED is an off-line EEPROM microcode loader for the 5830 DAS disk subsystem. LEED loads the microcode into the EEPROM from a predetermined location in central memory and verifies that it loaded correctly. The microcode must have been previously loaded into central memory via the CMSE CC command.

LEED does not execute on a CYBER 930 system.

ASSUMPTIONS

LEED assumes that the microcode (COS) for the controller is loaded into central memory prior to execution.

RESTRICTIONS

LEED does not test any of the disk subsystem.

The microcode must be loaded into central memory before executing LEED.

The microcode size is hardcoded into parameters 11 and 12. This value must be changed if the size of the microcode changes. The value is 257542 decimal (767006 octal or 3EE06 hex)

No other programs are allowed to be executing under CMSE while LEED is performing EEROM loading.

LOADING PROCEDURES

LEED is executed using the following command buffer.

GO,LEED <cr>

NOTE: CMSE must be CM mode to execute this command buffer.

An example and explanation of that command buffer.

0000	LEED	Command buffer title
0007	CC,MH427,1000	Load the microcode into central memory
0010	CP,C,LEED,,	Load the test
0011	EP,/,00125,00000	Channel 00 Controller 0 Unit 00
0012	EP,/,00126,0	0=Port A, 1=Port 1
0013	EP,/,00133,00000	Upper Central Memory Location Bits
0014	EP,/,00134,10000	Lower Central Memory Location Bits
0015	BP,/,	Assign PP to B display
0016	RU,/,100	Start execution
0017	TB	Terminate Command Buffer

RUNNING PROCEDURES

S <cr> Stop command. LEED will go into an idle loop whereby communication is maintained with CMSE but no test activity will take place.

Spacebar Starts or resumes test execution.

R <cr> Restarts the test from the beginning.

Cxx or Sxx <cr> Clear/set xx bit of PARAM0/1, where xx is the bit mnemonic such as SS, ST.

EP,num,adrs,data Enter parameter data into PP num at location adrs. See parameters for definitions and locations of test parameters.

PARAMETERS

The parameter words are located at location 00122(8) in PP memory. Bit 0 is defined as the least significant bit of a word.

PARAM0 - Test Control (Location 00122(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
*	**	DE	DR	NU	NU	RC	RB	RS	RT	LE	SE	SC	SB	SS	ST
ST	Stop at end of test							SE	Stop on error						
SS	Stop at end of section							LE	Log errors in dayfile						
SB	Stop at end of subsection							RT	Repeat test						
SC	Stop at end of condition							RS	Repeat section						
RB	Repeat subsection							DR	Bypass all messages						
RC	Repeat condition							DE	Display only error messages						
**	Reserved for CMSE 180 use							*	Enable CMSE to alter PARAM0 bits via the Cxx/Sxx commands (EP command must be used to alter this parameter.)						
NU	Not Used														

Default selection is 100021(8)/8011(16). This corresponds to setting ST,SE and enabling CMSE to alter PARAM0 bits.

PARAM1 - Test Control (Location 00123(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
x	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	x	NU	NU

Bit 2 Bypass parameter stop.															
Bit 3 Must be clear															
Bit 15 Enable CMSE to alter PARAM1 bits.															
NU Not used															

Default selection is 100000(8)/8000(16). This corresponds to enabling CMSE to alter PARAM1 bits. Use the EP command to set or clear these parameters.

PARAM2 - Repeat Test Count (Location 00124(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Bits 0...15 Repeat Test Count

Default is zero. The test will repeat the number of times (-1) contained in this location. The test will then unconditionally exit if the Repeat Test parameter bit is not set (PARAM0 Bit 6).

PARAM3 - Channel, Controller, Unit Select (Location 00125(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

NU	CH	CH	CH	CH	CH	CH	CM	CM	CM	UN	UN	UN	UN	UN	U
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

Bits 0...5 Unit Select

Bits 6...8 Control Module Select

Bits 9...14 Channel Number Select

Bits 15 Not Used (must be zero)

Default is 11000(8)/1200(16)

PARAM4 - IPI Port Selection (Location 00126(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Bit 0 Port Select 0-Port A, 1-Port B

Bits 1...15 Not Used

Default is zero.

PARAM5 - Section Select (Location 00127(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Bit 0 Section 0

Bit 1...15 Not Used

Default is 00001.

PARAM6...PARAM8 Not Used (Locations 00130(8)...00132(8))

PARAM9 - Upper Central Memory Address (Location 00133(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	0
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Bits 0...15 Upper bits of Central Memory Address

Default selection is 000000.

PARAM10 - Lower Central Memory Address (Location 00134(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Lower bits of Central Memory Address

Default selection is 0010000(16)/10000(8)

PARAM11 - Upper 8 bits of Microcode Length (Location 00135(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Upper 8 bits of Microcode Length

Default selection is 000076(8)/3E(16)

PARAM12 - Lower 12 bits of Microcode Length (Location 00136(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Lower 12 bits of Microcode Length

Default selection is 007006(8)/E06(16)

PARAM13...PARAM17 Not Used (Locations 00137(8)...00143(8))

PARAM18 - Repeat Subsection Count (Location 00144(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Repeat Subsection Count

The test will automatically repeat each subsection in the selected sections the number of times (-1) contained in this location. If PARAM18 = 0002, each subsection will be repeated once, resulting in two passes thru each subsection. Repeat Subsection PARAM0 bit 8 must be set.

Default selection is zero.

MESSAGES

Since all test messages are displayed on the B display, the B display must be assigned to the PP in which the test is executing before the test messages will be displayed. Note that dropping the test display by assigning the B display to a different PP, or central memory, will cause the present displayed test message to be lost. Assigning the B display back to the test PP will result in a blank display until the test displays a new message. The following is the general format for all messages.

```
LEED ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm UNuu  
EC1=0000 EC2=YYEE TE=TTTT RN=NNNN  
AAA-----AAA
```

Where:

ZZ = Message type (one of the following)

- RU = Running
- SC = Stopped at end of condition
- SB = Stopped at end of subsection
- SS = Stopped at end of section
- ST = Stopped at end of test
- SE = Stopped on error
- RC = Repeating condition
- RB = Repeating subsection
- RS = Repeating section
- HT = Halted (operator stop)

XXXX = Pass count (decimal)

- SS = Current section number (decimal)
- BB = Current subsection number (decimal)
- CC = Current condition number (decimal)
- HH = IPI channel number (octal)
- MM = Controller
- UU = Disk unit

0000 = Error code 1 (hex) see Appendix A

- EE = Error code 2
- YY = 00 for parameter, 10 for channel reserve, 20 for channel fault, 40 for disk 50 for data compare.

TTTT = Total error count (decimal)

NNNN = Random or base number used for generating data (hex)

AAA = Verbal error description (1 or more lines)

NORMAL MESSAGES

The following message is displayed at the beginning of the test to allow the user to set test parameters. This display is bypassed when the bypass parameter stop bit is set, PARAM1 bit 2.

LEED SET PARAMS PA=0122B YY/MM/DD

Where:

PA = FWA of parameter area in PP memory

YY/MM/DD = Year/Month/Day (test's version assembly date)

The following message is displayed to warn the user of the time required to load the EEPROM.

LEED ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm UNuu

DAS EEPROM LOADER
LOADING DAS EEPROM

----- WARNING -----
EXECUTION OF THIS PROGRAM WILL
LOAD NEW MICROCODE INTO THE EEPROM
EXECUTION TIME IS BETWEEN 1 AND 9 MINS.
THE MICROCODE MUST BE IN CENTRAL MEMORY
AND PARAMS 9 AND 10 SET BEFORE STARTING

MICROCODE LEVEL xx IS CURRENTLY LOADED

ENTER (SPACE BAR) TO CONTINUE.

----- WARNING -----

xx is the microcode level currently loaded in the Control Module. If the microcode level could not be determined, the message MICROCODE LEVEL CANNOT BE DETERMINED is displayed.

The following message is displayed when the microcode has been properly loaded.

LEED ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm UNuu

DAS EEPROM LOADER
LOADING DAS EEPROM

MICROCODE LEVEL XX SUCCESSFULLY LOADED.
PRESS ANY KEY TO END.

The following message is displayed to tell the user that the task is still being executed. This will normally be displayed when EEPROM loading is underway.

LEED ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm UNuu

DAS EEPROM LOADER
LOADING DAS EEPROM

TASK BUSY

ERROR MESSAGES

This is the basic format for all disk subsystem error messages. Driver status and low level error code are software status information provided by the common decks, COMPIPI and COMPIPA. Refer to the section COMPIPI/COMPIPA for further information. Hardware major status and status buffer words are provided when available.

LEED SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=9000 EC2=4M0F TE=000T RN=NNNN

DAS EEPROM LOADER
ST-----ST

DISK SUBSYSTEM ERROR

DRIVER STATUS GGGGH ADAPTER STATES AAAAH

MAJOR STATUS RRRRH LOW LEVEL ERROR CODE LLLH

STATUS BUFFER (HEX)

01D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
09D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
17D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
25D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD

WHERE:

M = Drive status priority 1-2 error.
F = Drive status priority 3 error (failing sequence).
GGGG = Driver status.
LLLL = Low level error code.
RRRR = Major status.
DDDD = Status buffer word in hex.
AAAA = Adapter status word

EC2 values and brief description of error.

400F Conditional success
This error indicates that the disk operation completed successfully, but only after retry. Failure data is contained in the status buffer.

- 410F Drive busy
This error occurs if the drive is reserved from the other access.
- 420F Drive not ready
This error indicates that the drive is present, but not ready and doesn't have a fault. This can occur if the drive is not spun up.
- 430F CM/Drive path not operational
This error indicates that the controller/drive is unable to send or receive commands.
- 440F Class 3 response packet was received
This error indicates that a critical class 3 response packet was received from the controller. Error information is available in the status buffer.
- 450F Subsystem error
This error occurs as the result of some subsystem failure and no status is available from the controller.
- 460F Adapter error
This error code indicates a problem with the IPI adapter.

The following error message will appear if a subsystem failure occurs and no status is available from the subsystem.

```
LEED SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=9010 EC2=500C TE=000T RN=NNNN
```

```
DAS EEPROM LOADER
ST-----ST
```

STATUS ERROR

The following error message will appear if the channel specified in PARAM3 is reserved to some other PP.

```
LEED SE PCXXXX S000Y SB000Z C0000 CHCC CMmm UNuu
EC1=F200 EC2=1000 TE=000T RN=NNNN
```

```
DAS EEPROM LOADER
ST-----ST
```

UNABLE TO RESERVE CHANNEL XX

INTRODUCTION

LEEP is an off-line EEPROM microcode loader for the 9836 and 9853 disk subsystems. LEEP loads the microcode into the EEPROM from a predetermined location in central memory and verifies that it loaded correctly. The microcode must have been previously loaded into central memory via the CMSE CC command.

LEEP does not execute on a CYBER 930 system.

ASSUMPTIONS

LEEP assumes that the microcode (COS) for the controller is loaded into central memory prior to execution.

RESTRICTIONS

LEEP does not test any of the disk subsystem.

The microcode must be loaded into central memory before executing LEEP.

The microcode size is hardcoded into parameters 11 and 12. This value must be changed if the size of the microcode changes. The value is 195214 decimal (575216 octal or 2FA8E hex)

No other programs are allowed to be executing under CMSE while LEEP is performing EEROM loading.

LOADING PROCEDURES

LEEP is executed using the following command buffer.

GO,LEEP <cr>

NOTE: CMSE must be in CM mode to execute this command buffer.

An example and explanation of that command buffer.

0000	LEEP	Command buffer title
0007	CC,MH426,1000	Load the microcode into central memory
0010	CP,C,LEEP,,,	Load the test
0011	EP,/,00125,00000	Channel 00 Controller 0 Unit 00
0012	EP,/,00126,0	0=Port A, 1=Port 1
0013	EP,/,00133,00000	Upper Central Memory Location Bits
0014	EP,/,00134,10000	Lower Central Memory Location Bits
0015	BP,/;,	Assign PP to B display
0016	RU,/,100	Start execution
0017	TB	Terminate Command Buffer

RUNNING PROCEDURES

S <cr>	Stop command. LEEP will go into an idle loop whereby communication is maintained with CMSE but no test activity will take place.
Spacebar	Starts or resumes test execution.
R <cr>	Restarts the test from the beginning.
Cxx or Sxx <cr>	Clear/set xx bit of PARAM0/1, where xx is the bit mnemonic such as SS, ST.
EP,num,adrs,data	Enter parameter data into PP num at location adrs. See parameters for definitions and locations of test parameters.

PARAMETERS

The parameter words are located at location 00122(8) in PP memory. Bit 0 is defined as the least significant bit of a word.

PARAM0 - Test Control (Location 00122(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
*	**	DE	DR	NU	NU	RC	RB	RS	RT	LE	SE	SC	SB	SS	ST
ST	Stop at end of test							SE	Stop on error						
SS	Stop at end of section							LE	Log errors in dayfile						
SB	Stop at end of subsection							RT	Repeat test						
SC	Stop at end of condition							RS	Repeat section						
RB	Repeat subsection							DR	Bypass all messages						
RC	Repeat condition							DE	Display only error messages						
**	Reserved for CMSE 180 use							*	Enable CMSE to alter PARAM0 bits						
NU	Not Used								via the Cxx/Sxx commands						
									(EP command must be used to alter this parameter.)						

Default selection is 100021(8)/8011(16). This corresponds to setting ST,SE and enabling CMSE to alter PARAM0 bits.

PARAM1 - Test Control (Location 00123(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
x	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	x	NU	NU

Bit 2 Bypass parameter stop.															
Bit 3 Must be clear															
Bit 15 Enable CMSE to alter PARAM1 bits.															
NU Not used															

Default selection is 100000(8)/8000(16). This corresponds to enabling CMSE to alter PARAM1 bits. Use the EP command to set or clear these parameters.

PARAM2 - Repeat Test Count (Location 00124(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Bits 0...15 Repeat Test Count

Default is zero. The test will repeat the number of times (-1) contained in this location. The test will then unconditionally exit if the Repeat Test parameter bit is not set (PARAM0 Bit 6).

PARAM3 - Channel, Controller, Unit Select (Location 00125(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

NU	CH	CH	CH	CH	CH	CH	CM	CM	CM	UN	UN	UN	UN	UN	U
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

Bits 0...5 Unit Select
 Bits 6...8 Control Module Select
 Bits 9...14 Channel Number Select
 Bits 15 Not Used (must be zero)

Default is 11000(8)/1200(16)

PARAM4 - IPI Port Selection (Location 00126(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	:
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

Bit 0 Port Select 0-Port A, 1-Port B
 Bits 1...15 Not Used

Default is zero.

PARAM5 - Section Select (Location 00127(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	:
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---

Bit 0 Section 0
 Bit 1...15 Not Used

Default is 00001.

PARAM6...PARAM8 Not Used (Locations 00130(8)...00132(8))

PARAM9 - Upper Central Memory Address (Location 00133(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Bits 0...15 Upper bits of Central Memory Address

Default selection is 000000.

PARAM10 - Lower Central Memory Address (Location 00134(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Lower bits of Central Memory Address

Default selection is 0010000(16)/10000(8)

PARAM11 - Upper 8 bits of Microcode Length (Location 00135(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Upper 8 bits of Microcode Length

Default selection is 000057(8)/2F(16)

PARAM12 - Lower 12 bits of Microcode Length (Location 00136(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Lower 12 bits of Microcode Length

Default selection is 005216(8)/A8E(16)

PARAM13...PARAM17 Not Used (Locations 00137(8)...00143(8))

PARAM18 - Repeat Subsection Count (Location 00144(8))

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx

Bits 0...15 Repeat Subsection Count

The test will automatically repeat each subsection in the selected sections the number of times (-1) contained in this location. If PARAM18 = 0002, each subsection will be repeated once, resulting in two passes thru each subsection. Repeat Subsection PARAM0 bit 8 must be set.

Default selection is zero.

MESSAGES

Since all test messages are displayed on the B display, the B display must be assigned to the PP in which the test is executing before the test messages will be displayed. Note that dropping the test display by assigning the B display to a different PP, or central memory, will cause the present displayed test message to be lost. Assigning the B display back to the test PP will result in a blank display until the test displays a new message. The following is the general format for all messages.

```
LEEP ZZ PCXXXX S00SS S00BB C00CC CHhh CMmm UNuu  
EC1=0000 EC2=YYEE TE=TTTT RN=NNNN  
AAA-----AAA
```

Where:

ZZ = Message type (one of the following)

- RU = Running
- SC = Stopped at end of condition
- SB = Stopped at end of subsection
- SS = Stopped at end of section
- ST = Stopped at end of test
- SE = Stopped on error
- RC = Repeating condition
- RB = Repeating subsection
- RS = Repeating section
- HT = Halted (operator stop)

XXXX = Pass count (decimal)

SS = Current section number (decimal)

BB = Current subsection number (decimal)

CC = Current condition number (decimal)

HH = IPI channel number (octal)

MM = Controller

UU = Disk unit

0000 = Error code 1 (hex) see Appendix A

EE = Error code 2

YY = 00 for parameter, 10 for channel reserve, 20 for channel fault, 40 for disk 50 for data compare.

TTTT = Total error count (decimal)

NNNN = Random or base number used for generating data (hex)

AAA = Verbal error description (1 or more lines)

NORMAL MESSAGES

The following message is displayed at the beginning of the test to allow the user to set test parameters. This display is bypassed when the bypass parameter stop bit is set, PARAM1 bit 2.

LEEP SET PARAMS PA=0122B YY/MM/DD

Where:

PA = FWA of parameter area in PP memory

YY/MM/DD = Year/Month/Day (test's version assembly date)

The following message is displayed to warn the user of the time required to load the EEPROM.

LEEP ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm UNuu

CM-3 EEPROM LOADER
LOADING CM-3 EEPROM

----- WARNING -----
EXECUTION OF THIS PROGRAM WILL
LOAD NEW MICROCODE INTO THE EEPROM
EXECUTION TIME IS BETWEEN 1 AND 9 MINS.
THE MICROCODE MUST BE IN CENTRAL MEMORY
AND PARAMS 9 AND 10 SET BEFORE STARTING

MICROCODE LEVEL xx IS CURRENTLY LOADED

ENTER (SPACE BAR) TO CONTINUE.
----- WARNING -----

xx is the microcode level currently loaded in the Control Module. If the microcode level could not be determined, the message MICROCODE LEVEL CANNOT BE DETERMINED is displayed.

The following message is displayed when the microcode has been properly loaded.

LEEP ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm UNuu

CM-3 EEPROM LOADER
LOADING CM-3 EEPROM

MICROCODE LEVEL XX SUCCESSFULLY LOADED.
PRESS ANY KEY TO END.

The following message is displayed to tell the user that the task is still being executed. This will normally be displayed when EEPROM loading is underway.

LEEP ZZ PCXXXX S00SS SB00BB C00CC CHhh CMmm UNuu

CM-3 EEPROM LOADER
LOADING CM-3 EEPROM

TASK BUSY

ERROR MESSAGES

This is the basic format for all disk subsystem error messages. Driver status and low level error code are software status information provided by the common decks, COMPIPI and COMPIPA. Refer to the section COMPIPI/COMPIPA for further information. Hardware major status and status buffer words are provided when available.

LEEP SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=9000 EC2=4M0F TE=000T RN=NNNN

CM-3 EEPROM LOADER
ST-----ST

DISK SUBSYSTEM ERROR

DRIVER STATUS GGGGH ADAPTER STATES AAAAH

MAJOR STATUS RRRRH LOW LEVEL ERROR CODE LLLH

STATUS BUFFER (HEX)

01D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
09D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
17D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
25D	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD

WHERE:

M = Drive status priority 1-2 error.
F = Drive status priority 3 error (failing sequence).
GGGG = Driver status.
LLLL = Low level error code.
RRRR = Major status.
DDDD = Status buffer word in hex.
AAAA = Adapter status word

EC2 values and brief description of error.

400F Conditional success
This error indicates that the disk operation completed successfully, but only after retry. Failure data is contained in the status buffer.

- 410F Drive busy
This error occurs if the drive is reserved from the other access.
- 420F Drive not ready
This error indicates that the drive is present, but not ready and doesn't have a fault. This can occur if the drive is not spun up.
- 430F CM/Drive path not operational
This error indicates that the controller/drive is unable to send or receive commands.
- 440F Class 3 response packet was received
This error indicates that a critical class 3 response packet was received from the controller. Error information is available in the status buffer.
- 450F Subsystem error
This error occurs as the result of some subsystem failure and no status is available from the controller.
- 460F Adapter error
This error code indicates a problem with the IPI adapter.

The following error message will appear if a subsystem failure occurs and no status is available from the subsystem.

```
LEEP SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=9010 EC2=500C TE=000T RN=NNNN
```

```
CM-3 EEPROM LOADER
ST-----ST
```

STATUS ERROR

The following error message will appear if the channel specified in PARAM3 is reserved to some other PP.

```
LEEP SE PCXXXX S000Y SB000Z C0000 CHhh CMmm UNuu
EC1=F200 EC2=1000 TE=000T RN=NNNN
```

```
CM-3 EEPROM LOADER
ST-----ST
```

UNABLE TO RESERVE CHANNEL XX

LIMD [LIMD.BIN]

Introduction

LIMD is a console-based EEPROM microcode loader for the 5830 Disk Array subsystem when attached to a Cyber 93X system.

LIMD is designed to load the EEPROM microcode and verify the correct status following the operation.

Assumptions

LIMD assumes that the OS is not running.

Restrictions

LIMD does not test any of the disk subsystem.

No other programs are allowed to be executing while LIMD is performing EEPROM loading.

Loading Procedure

LIMD resides on the hard disk on the system console. All loading is performed via the console driven menus. The steps are as follows:

1. From the console main menu, select "Maintenance."
2. From the maintenance menu, select "Engineering Tasks."
3. From the engineering tasks menu, select "DAS 5830 Microcode Loader."
4. A message will appear at the bottom of the screen indicating that the console is "Uploading LIMD.BIN". This process takes a few minutes.
5. Once the LIMD menu appears you will be required to enter "1" for Auto-scan mode or "2" for manual mode.
6. After manually inputting the channel(s) or having auto-scan determine the channel(s), you have the option of selecting whether or not to update that controller's microcode.
7. Press the F3 key to start the loading of microcode.

Running Procedure

The load procedure is started immediately after the F3 key is pressed.

Messages

The following is the general format for all messages.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      DAS MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

Normal Messages

The following is the LIMD menu for selecting automatic or manual channel input.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      DAS MICROCODE UPDATE UTILITY
                      CIP LEVEL - COSxx
```

ENTER 1 - AUTO SCAN OR 2 - MANUAL INPUT FOR DAS

The following is displayed if automatic channel selection was selected.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      DAS MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

SCANNING CH xx EQ xx FOR DAS ... PLEASE WAIT ...

The following is displayed if the manual channel selection was selected.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      DAS MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

ENTER CH AND EQ NUMBER FOR 1ST CLUSTER (EG. 051) OR <CR> TO CONTINUE.

After the channel selection is complete (manual or automatic), the following display is presented.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
DAS MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	DAS CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	NO	

PLEASE SELECT DAS'S AND HIT F3 TO START DOWNLOAD.

The following message is displayed after pressing the F3 key.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
DAS MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	DAS CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	YES	

COPYING MH427 LEVEL XX TO CM ...PLEASE WAIT...
UPLOADING DATA TO PPU ...PLEASE WAIT...

The following message is displayed while loading the microcode.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
DAS MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	DAS CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	YES	UPDATING

VERIFYING LOAD ...PLEASE WAIT...

Error Messages

If an error is encountered during the loading of the microcode, the following is displayed.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR      DEADSTART PP 00
                      DAS MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

LINE	DAS CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	YES	FAILED

FAILURE - DAS ON CH xx EQ xx STATUS xxxxxx TASK xx
HIT <CR> TO IGNORE OR <ESC> TO EXIT

Refer to the section on COMPIPI/COMPIPA for a detailed description of STATUS and TASK. NOTE: The status and task numbers are displayed in octal.

NO OT XX LEVEL 75AHM P

LIMX [LIMX.BIN]

Introduction

LIMX is a console-based EEPROM microcode loader for the 9836 and 9853 disk subsystems when attached to a Cyber 93X system.

LIMX is designed to load the EEPROM microcode and verify the correct status following the operation.

Assumptions

LIMX assumes that the OS is not running.

Restrictions

LIMX does not test any of the disk subsystem.

No other programs are allowed to be executing while LIMX is performing EEPROM loading.

Loading Procedure

LIMX resides on the hard disk on the system console. All loading is performed via the console driven menus. The steps are as follows:

1. From the console main menu, select "Maintenance."
2. From the maintenance menu, select "Engineering Tasks."
3. From the engineering tasks menu, select "Disk 9836/9853 Microcode Loader."
4. A message will appear at the bottom of the screen indicating that the console is "Uploading LIMX.BIN". This process takes a few minutes.
5. Once the LIMX menu appears you will be required to enter "1" for Auto-scan mode or "2" for manual mode.
6. After manually inputting the channel(s) or having auto-scan determine the channel(s), you have the option of selecting whether or not to update that controller's microcode.
7. Press the F3 key to start the loading of microcode.

Running Procedure

The load procedure is started immediately after the F3 key is pressed.

Messages

The following is the general format for all messages.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      CM3 MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

Normal Messages

The following is the LIMX menu for selecting automatic or manual channel input.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      CM3 MICROCODE UPDATE UTILITY
                      CIP LEVEL - COSxx
```

ENTER 1 - AUTO SCAN OR 2 - MANUAL INPUT FOR CM3

The following is displayed if automatic channel selection was selected.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      CM3 MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

SCANNING CH xx EQ xx FOR CM3 ... PLEASE WAIT ...

The following is displayed if the manual channel selection was selected.

```
MONITORING PP 0      STANDALONE PP DIAGNOSTIC MONITOR    DEADSTART PP 00
                      CM3 MICROCODE UPDATE UTILITY
                      CIP LEVEL COSxx
```

ENTER CH AND EQ NUMBER FOR 1ST CLUSTER (EG. 051) OR <CR> TO CONTINUE.

After the channel selection is complete (manual or automatic), the following display is presented:

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
CM3 MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	CM3 CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	NO	

PLEASE SELECT CM3'S AND HIT F3 TO START DOWNLOAD.

The following message is displayed after pressing the F3 key.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
CM3 MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	CM3 CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	YES	

COPYING MH426 LEVEL XX TO CM ...PLEASE WAIT...
UPLOADING DATA TO PPU ...PLEASE WAIT...

The following message is displayed while loading the microcode.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
CM3 MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	CM3 CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	YES	UPDATING

VERIFYING LOAD..PLEASE WAIT...

Error Messages

If an error is encountered during the loading of the microcode, the following is displayed.

MONITORING PP 0 STANDALONE PP DIAGNOSTIC MONITOR DEADSTART PP 00
CM3 MICROCODE UPDATE UTILITY
CIP LEVEL COSxx

LINE	CM3 CHAN	ADDRESS EQUIP	MICROCODE LEVEL	SELECTED YES/NO	STATUS
01	01	0	COSxx	YES	FAILED

FAILURE - CM3 ON CH xx EQ xx STATUS xxxxxx TASK xx
HIT <CR> TO IGNORE OR <ESC> TO EXIT

Refer to the section on COMPIPI/COMPIPA for a detailed description of STATUS and TASK. Note: The status and task numbers are displayed in octal.

STATUS DETECTED MICROCODE ERROR AND
CHAM EQUIP ERROR

0 10 10

...TIAW 28AE19... MD OT XX LEVEL 28AHM